Pinnacle
ENVIRONMENTAL SOLUTIONS

a division of EMCON

PROTECTION
99 MAR 11 PM 2:41

March 8, 1999
Project 20805-121.006

Mr. John Sullivan
17760 Sweetbriar Place
Castro Valley, California 94546

Re: Quarterly Groundwater Monitoring Results, Fourth Quarter 1998, for Chateau Manor Apartments, located at 724 Lewelling Boulevard, San Leandro, California

Dear Mr. Sullivan:

Pinnacle Environmental Solutions, a division of EMCON (Pinnacle), is submitting the attached laboratory analytical results for groundwater samples collected from wells MW-9 and MW-10 during the fourth quarter of 1998. This wells are located at Chateau Manor Apartments, 724 Lewelling Boulevard, San Leandro, California. The groundwater samples were collected during quarterly sampling of the ARCO Products Company (ARCO) Service Station No. 0601, located at 712 Lewelling Boulevard, San Leandro, California. The laboratory analytical results indicate that the groundwater sample concentrations were not detectable for total petroleum hydrocarbons as gasoline, and the gasoline constituents benzene, toluene, ethylbenzene, and total xylenes.

Please call if you have questions.

Sincerely,

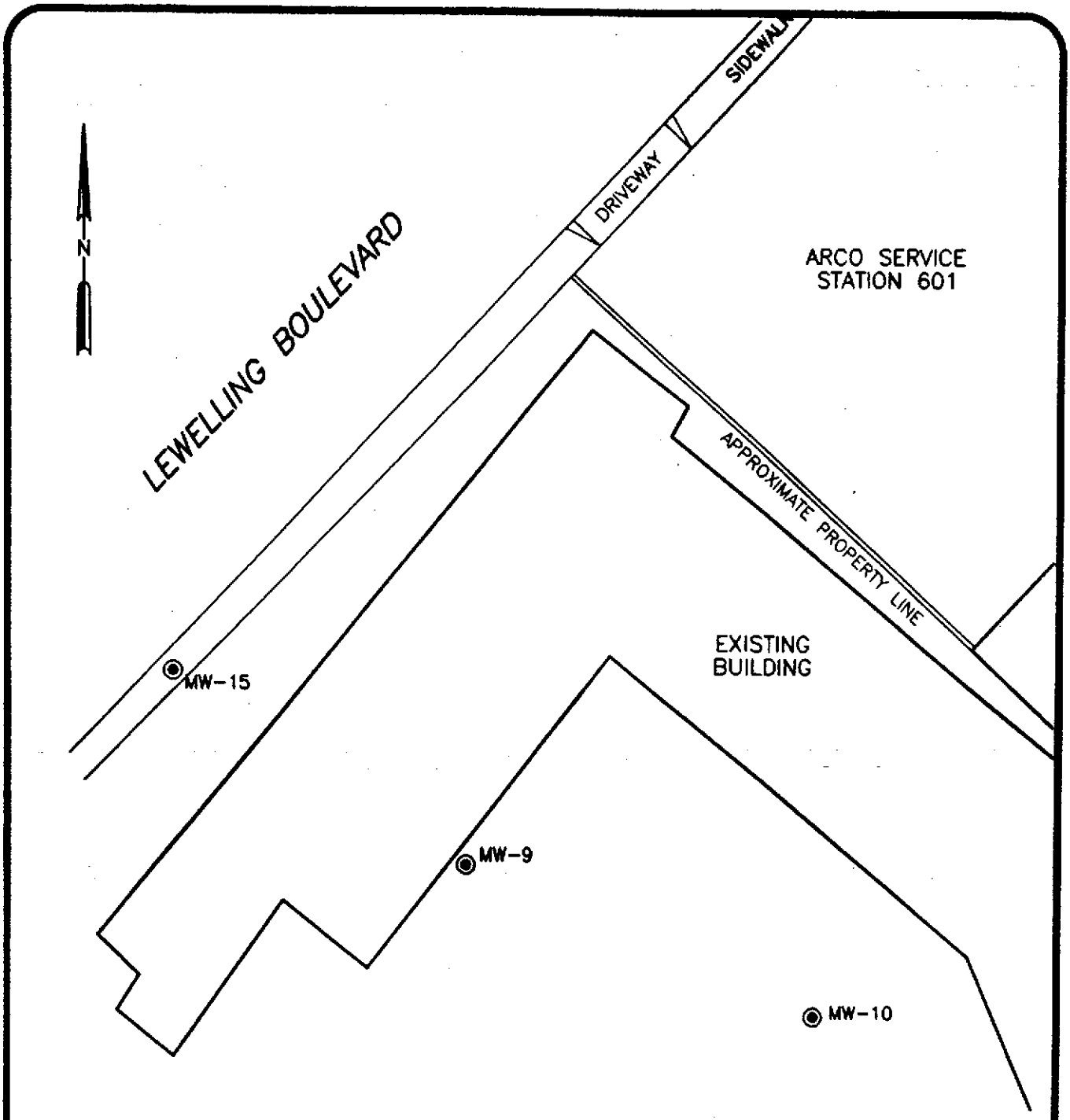
Pinnacle

Glen VanderVeen
Project Manager

Attachments: Figure 1 Site Plan
Appendix A Copies of Certified Analytical Report and Chain-of Custody-Documentation, Wells MW-9 and MW-10, Fourth Quarter 1998

cc: Scott Seery, ACHCSA
Paul Supple, ARCO Products Company
File

144-A Mayhew Way Walnut Creek, California 94596 (510) 977-9020 (510) 977-9030 Fax



EXPLANATION

◉ Groundwater monitoring well

0 40 80

APPROXIMATE SCALE IN FEET

1" 1/2" 0"

Pinnacle
ENVIRONMENTAL SOLUTIONS
A DIVISION OF EMCON

DATE NOV. 1998
DWN KAB
APP
REV
PROJECT NO.
20805-121.005

FIGURE 1
CHATEAU MANOR APRATMENTS
724 LEWELLING BLVD.
SAN LEANDRO, CALIFORNIA
SITE PLAN

IMAGE Files: <No Images>
XREF Files: <No Xrefs>
Dimscale: 40 Ltscale: 40 Paltscale: 0
SANJOSE/CADD: N:\DWG\805121\SJSITE.DWG Tue, 01/Dec/98 10:54am kblock

APPENDIX A

COPIES OF CERTIFIED ANALYTICAL REPORT, AND CHAIN-OF-CUSTODY DOCUMENTATION, WELLS MW-9 AND MW-10 FOURTH QUARTER 1998

Columbia Analytical Services, Inc.
An Employee-Owned Company

October 27, 1998 Service Request No.: S9802771

RECEIVED
OCT 29 1998
BY:

Glen Vanderveen
PINNACLE
144 A Mayhew Wy.
Walnut Creek, CA 94596

RE: 20805-121.005/TO#22312.00/RAT8/601 SAN LEANDRO

Dear Mr. Vanderveen:

The following pages contain analytical results for sample(s) received by the laboratory on October 14, 1998. Results of sample analyses are followed by Appendix A which contains sample custody documentation and quality assurance deliverables requested for this project. The work requested has been assigned the Service Request No. listed above. To help expedite our service, please refer to this number when contacting the laboratory.

Analytical results were produced by procedures consistent with Columbia Analytical Services' (CAS) Quality Assurance Manual (with any deviations noted). Signature of this CAS Analytical Report below confirms that pages 2 through 10, following, have been thoroughly reviewed and approved for release in accord with CAS Standard Operating Procedure ADM-DatRev3.

Please feel welcome to contact me should you have questions or further needs.

Sincerely,

Steven L. Green
Project Chemist

Bernadette A. Cox for

Greg Anderson
Regional QA Coordinator

COLUMBIA ANALYTICAL SERVICES, Inc.
Acronyms

A2LA	American Association for Laboratory Accreditation
ASTM	American Society for Testing and Materials
BOD	Biochemical Oxygen Demand
BTEX	Benzene, Toluene, Ethylbenzene, Xylenes
CAM	California Assessment Metals
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
COD	Chemical Oxygen Demand
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DLCS	Duplicate Laboratory Control Sample
DMS	Duplicate Matrix Spike
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
IC	Ion Chromatography
ICB	Initial Calibration Blank sample
ICP	Inductively Coupled Plasma atomic emission spectrometry
ICV	Initial Calibration Verification sample
J	Estimated concentration. The value is less than the MRL, but greater than or equal to the MDL. If the value is equal to the MRL, the result is actually <MRL before rounding.
LCS	Laboratory Control Sample
LUFT	Leaking Underground Fuel Tank
M	Modified
MBAS	Methylene Blue Active Substances
MCL	Maximum Contaminant Level. The highest permissible concentration of a substance allowed in drinking water as established by the U. S. EPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
MS	Matrix Spike
MTBE	Methyl tert-Butyl Ether
NA	Not Applicable
NAN	Not Analyzed
NC	Not Calculated
NCASI	National Council of the paper industry for Air and Stream Improvement
ND	Not Detected at or above the method reporting/detection limit (MRL/MDL)
NIOSH	National Institute for Occupational Safety and Health
NTU	Nephelometric Turbidity Units
ppb	Parts Per Billion
ppm	Parts Per Million
PQL	Practical Quantitation Limit
QA/QC	Quality Assurance/Quality Control
RCRA	Resource Conservation and Recovery Act
RPD	Relative Percent Difference
SIM	Selected Ion Monitoring
SM	Standard Methods for the Examination of Water and Wastewater, 18th Ed., 1992
STLC	Solubility Threshold Limit Concentration
SW	Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, 3rd Ed., 1986 and as amended by Updates I, II, IIA, and IIB.
TCLP	Toxicity Characteristic Leaching Procedure
TDS	Total Dissolved Solids
TPH	Total Petroleum Hydrocarbons
tr	Trace level. The concentration of an analyte that is less than the PQL but greater than or equal to the MDL. If the value is equal to the PQL, the result is actually <PQL before rounding.
TRPH	Total Recoverable Petroleum Hydrocarbons
TSS	Total Suspended Solids
TTLC	Total Threshold Limit Concentration
VOA	Volatile Organic Analyte(s)

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: ARCO Products Company
Project: 20805-121.005/TO#22312.00/RAT8/601 SAN LEANDRO
Sample Matrix: Water

Service Request: S9802771
Date Collected: 10/14/98
Date Received: 10/14/98

BTEX, MTBE and TPH as Gasoline

Sample Name: MW-9(15)
Lab Code: S9802771-001
Test Notes:

Units: ug/L (ppb)
Basis: NA

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
TPH as Gasoline	EPA 5030	CA/LUFT	50	1	NA	10/23/98	ND	
Benzene	EPA 5030	8020	0.5	1	NA	10/23/98	ND	
Toluene	EPA 5030	8020	0.5	1	NA	10/23/98	ND	
Ethylbenzene	EPA 5030	8020	0.5	1	NA	10/23/98	ND	
Xylenes, Total	EPA 5030	8020	0.5	1	NA	10/23/98	ND	
Methyl *tert*-Butyl Ether	EPA 5030	8020	3	1	NA	10/23/98	ND	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	ARCO Products Company	**Service Request:**	9802771
Project:	20805-121.005/TO#22312.00/RAT8/601 SAN LEANDRO	**Date Collected:**	10/14/98
Sample Matrix:	Water	**Date Received:**	10/14/98

BTEX, MTBE and TPH as Gasoline

Sample Name:	MW-10(16)	Units:	ug/L (ppb)
Lab Code:	S9802771-002	Basis:	NA
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
TPH as Gasoline	EPA 5030	CA/LUFT	50	1	NA	10/22/98	ND	
Benzene	EPA 5030	8020	0.5	1	NA	10/22/98	ND	
Toluene	EPA 5030	8020	0.5	1	NA	10/22/98	ND	
Ethylbenzene	EPA 5030	8020	0.5	1	NA	10/22/98	ND	
Xylenes, Total	EPA 5030	8020	0.5	1	NA	10/22/98	ND	
Methyl *tert*-Butyl Ether	EPA 5030	8020	3	1	NA	10/22/98	ND	

1522/020597p

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	ARCO Products Company	**Service Request:**	S9802771
Project:	20805-121.005/TO#22312.00/RAT8/601 SAN LEANDRO	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA

BTEX, MTBE and TPH as Gasoline

Sample Name:	Method Blank	Units:	ug/L (ppb)
Lab Code:	S981021-WB1	Basis:	NA
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
TPH as Gasoline	EPA 5030	CA/LUFT	50	1	NA	10/21/98	ND	
Benzene	EPA 5030	8020	0.5	1	NA	10/21/98	ND	
Toluene	EPA 5030	8020	0.5	1	NA	10/21/98	ND	
Ethylbenzene	EPA 5030	8020	0.5	1	NA	10/21/98	ND	
Xylenes, Total	EPA 5030	8020	0.5	1	NA	10/21/98	ND	
Methyl *tert*-Butyl Ether	EPA 5030	8020	3	1	NA	10/21/98	ND	

1S22/020597p

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	ARCO Products Company	**Service Request:**	S9802771
Project:	20805-121.005/TO#22312.00/RAT8/601 SAN LEANDRO	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA

BTEX, MTBE and TPH as Gasoline

Sample Name:	Method Blank	Units:	ug/L (ppb)
Lab Code:	S981022-WB2	Basis:	NA
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
TPH as Gasoline	EPA 5030	CA/LUFT	50	1	NA	10/22/98	ND	
Benzene	EPA 5030	8020	0.5	1	NA	10/22/98	ND	
Toluene	EPA 5030	8020	0.5	1	NA	10/22/98	ND	
Ethylbenzene	EPA 5030	8020	0.5	1	NA	10/22/98	ND	
Xylenes, Total	EPA 5030	8020	0.5	1	NA	10/22/98	ND	
Methyl *tert*-Butyl Ether	EPA 5030	8020	3	1	NA	10/22/98	ND	

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: ARCO Products Company
Project: 20805-121.005/TO#22312.00/RAT8/601 SAN LEANDRO
Sample Matrix: Water

Service Request: S9802771
Date Collected: NA
Date Received: NA
Date Extracted: NA
Date Analyzed: NA

Surrogate Recovery Summary
BTEX, MTBE and TPH as Gasoline

Prep Method: EPA 5030
Analysis Method: 8020 CA/LUFT

Units: PERCENT
Basis: NA

Sample Name	Lab Code	Test Notes	Percent Recovery	
			4-Bromofluorobenzene	a,a,a-Trifluorotoluene
MW-9(15)	S9802771-001		97	91
MW-10(16)	S9802771-002		86	90
BATCH QC	S9802704-004MS		115	86
BATCH QC	S9802704-004DMS		112	93
Method Blank	S981021-WB1		100	99
Method Blank	S981022-WB2		108	92
CAS Acceptance Limits:			69-116	69-116

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	ARCO Products Company	**Service Request:**	S9802771
Project:	20805-121.005/TO#22312.00/RAT8/601 SAN LEANDRO	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
		Date Extracted:	NA
		Date Analyzed:	10/22/98

Matrix Spike/Duplicate Matrix Spike Summary
BTE

Sample Name:	BATCH QC	Units:	ug/L (ppb)
Lab Code:	S9802704-004MS, S9802704-004DMS	Basis:	NA
Test Notes:			

				Spike Level		Sample	Spike Result		Percent Recovery		CAS Acceptance	Relative Percent
Analyte	Prep Method	Analysis Method	MRL	MS	DMS	Result	MS	DMS	MS	DMS	Limits	Difference
Benzene	EPA 5030	8020	0.5	25	25	ND	25	26	100	104	75-135	4
Toluene	EPA 5030	8020	0.5	25	25	ND	25	26	100	104	73-136	4
Ethylbenzene	EPA 5030	8020	0.5	25	25	1.5	27	28	102	106	69-142	4

DMS/020597p

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: ARCO Products Company
Project: 20805-121.005/TO#22312.00/RAT8/601 SAN LEANDRO

Service Request: 9980277I
Date Analyzed: 10/22/98

Initial Calibration Verification (ICV) Summary
BTEX, MTBE and TPH as Gasoline

Sample Name: ICV
Lab Code: ICV1
Test Notes:

Units: ug/L (ppb)
Basis: NA

ICV Source:

Analyte	Prep Method	Analysis Method	True Value	Result	CAS Percent Recovery Acceptance Limits	Percent Recovery	Result Notes
TPH as Gasoline	EPA 5030	CA/LUFT	250	260	90-110	104	
Benzene	EPA 5030	8020	25	28	85-115	112	
Toluene	EPA 5030	8020	25	28	85-115	112	
Ethylbenzene	EPA 5030	8020	25	27	85-115	108	
Xylenes, Total	EPA 5030	8020	75	84	85-115	112	
Methyl *tert*-Butyl Ether	EPA 5030	8020	25	26	85-115	104	

ICV/032196

ARCO Products Company — Chain of Custody

Division of Atlantic/Richfield Company ~~9802730~~ M 10/19/98 Task Order No. 22312.00

ARCO Facility no. 0601	City (Facility) San Leandro	Project manager (Consultant) Glen VanderVeen	Laboratory Name CAS
ARCO engineer Paul Supple	Telephone no. (ARCO)	Telephone no. (Consultant) (408) 453-7300	Fax no. (Consultant) (408) 437-9526
Consultant name EMCON	Address (Consultant) 44-A Mayhew Way Walnut Creek, CA 94596		Contract Number

Method of shipment: Sampler will deliver

Sample I.D.	Lab no.	Container no.	Matrix: Soil	Matrix: Water	Matrix: Other	Preservation: Ice	Preservation: Acid	Sampling date	Sampling time	BTEX 602/EPA 8020	BTEX/TPH incld. MTBE EPA M602/8020/8015	TPH Modified 8015 Gas ☐ Diesel ☐	Oil and Grease 413.1 ☐ 413.2 ☐	TPH EPA 418.1/SM 503E	EPA 601/8010	EPA 624/8240	EPA 625/8270	TCLP Semi Metals ☐ VOA ☐ VOA ☐	CAM Metals EPA 6010/7000 TTLC ☐ STLC ☐	Lead Org/DHS ☐ Lead EPA 7420/7421 ☐
MW-9	(5) (1)	2		X		X	HCl	10/14/98	1010		X									
MW-10	(6) (2)	2		X		X	HCL	↓	1030		X									

Special Detection Limit/reporting: Lowest Possible

Special QA/QC: As Normal

Remarks: RAT 8
2-40ml HCL VOAs

#20805-121.005

Lab Number: 9802771

Turnaround Time:
- Priority Rush 1 Business Day ☐
- Rush 2 Business Days ☐
- Expedited 5 Business Days ☐
- Standard 10 Business Days ☒

Condition of sample:

Temperature received: Due: 10/28/98 R11/D3

	Date	Time			
Relinquished by sampler	10/14/98	1500	Received by: Joseph Machado CAS	10/14/98	1500
Relinquished by	Date	Time	Received by		
Relinquished by	Date	Time	Received by laboratory	Date	Time

Distribution: White Copy – Laboratory: Canary Copy – ARCO Environmental Engineering: Pink Copy – Consultant

Pinnacle
ENVIRONMENTAL SOLUTIONS

a division of EMCON

March 8, 1999
Project 20805-121.006

Mr. Paul Supple
ARCO Products Company
P.O. Box 6549
Moraga, California 94570

Re: Quarterly Groundwater Monitoring Report, Fourth Quarter 1998, for ARCO Service Station No. 0601, Located at 712 Lewelling Boulevard, San Leandro, California

Dear Mr. Supple:

Pinnacle Environmental Solutions, a division of EMCON (Pinnacle), is submitting the attached report which presents the results of the fourth quarter 1998 groundwater monitoring program at ARCO Products Company (ARCO) Service Station No. 0601, located at 712 Lewelling Boulevard, San Leandro, California. The monitoring program complies with the Alameda County Health Care Services Agency (ACHCSA) requirements regarding underground tank investigations.

LIMITATIONS

No monitoring event is thorough enough to describe all geologic and hydrogeologic conditions of interest at a given site. If conditions have not been identified during the monitoring event, results should not be construed as a guarantee of the absence of such conditions at the site, but rather as the product of the scope and limitations of work performed during the monitoring event.

Please call if you have questions.

Sincerely,

Pinnacle

Glen VanderVeen
Project Manager

Jay R. Johnson, R.G.
Senior Project Supervisor

Attachment: Quarterly Groundwater Monitoring Report, Fourth Quarter 1998

cc: Scott Seery, ACHCSA
Mike Bakaldin, SLFD

144-A Mayhew Way Walnut Creek, California 94596 (510) 977-9020 (510) 977-9030 Fax

Date: March 8, 1999

ARCO QUARTERLY GROUNDWATER MONITORING REPORT

Station No.: 0601 Address: 712 Lewelling Boulevard, San Leandro, California
Pinnacle Project No. 20805-121.006
ARCO Environmental Engineer/Phone No.: Paul Supple /(925) 299-8891
Pinnacle Project Manager/Phone No.: Glen VanderVeen /(925) 977-9020
Primary Agency/Regulatory ID No.: ACHCSA /Scott Seery

WORK PERFORMED THIS QUARTER (FOURTH - 1998):

1. Prepared and submitted quarterly groundwater monitoring report for third quarter 1998.
2. Performed quarterly groundwater monitoring and sampling for fourth quarter 1998.

WORK PROPOSED FOR NEXT QUARTER (FIRST - 1999):

1. Prepare and submit quarterly groundwater monitoring report for fourth quarter 1998.
2. Perform quarterly groundwater monitoring and sampling for first quarter 1999.
3. Evaluate potential off-site plume migration.

QUARTERLY MONITORING:

Current Phase of Project:	Quarterly Groundwater Monitoring
Frequency of Sampling:	Annual (1st quarter): MW-2, MW-11, MW-12, MW-13 Semi-annual (1st/3rd quarter): MW-9, MW-15 Quarterly: MW-1, MW-3 through MW-8, MW-10, MW-14
Frequency of Monitoring:	Quarterly (groundwater)
Is Floating Product (FP) Present On-site:	☐ Yes ☒ No
Cumulative FP Recovered to Date :	3.45 gallons, Well MW-1
FP Recovered This Quarter :	None
Bulk Soil Removed to Date :	1,565 cubic yards of TPH impacted soil
Bulk Soil Removed This Quarter :	None
Current Remediation Techniques:	Natural Attenuation
Average Depth to Groundwater:	8.1 feet
Groundwater Flow Direction and Gradient (Average):	0.02 ft/ft toward southeast

ATTACHMENTS:

- Table 1 - Groundwater Elevation and Analytical Data, Petroleum Hydrocarbons and Their Constituents
- Table 2 - Groundwater Flow Direction and Gradient
- Table 3 - Historical Groundwater Analytical Data, Metals
- Table 4 - Historical Groundwater Analytical Data, Volatile and Semivolatile Organic Compounds
- Table 5 - Approximate Cumulative Floating Product Recovered, Monitoring Well MW-1
- Figure 1 - Groundwater Analytical Summary Map
- Figure 2 - Groundwater Elevation Contour Map
- Appendix A - Sampling and Analysis Procedures
- Appendix B - Certified Analytical Reports and Chain-of-Custody Documentation
- Appendix C - Field Data Sheets

Table 1
Groundwater Elevation and Analytical Data
Petroleum Hydrocarbons and Their Constituents
1995 - Present***

ARCO Service Station 601
712 Lewelling Boulevard, San Leandro, California

Well Designation	Water Level Field Date	Top of Casing Elevation ft-MSL	Depth to Water feet	Groundwater Elevation ft-MSL	Floating Product Thickness feet	TPHG LUFT Method µg/L	Benzene EPA 8020 µg/L	Toluene EPA 8020 µg/L	Ethylbenzene EPA 8020 µg/L	Total Xylenes EPA 8020 µg/L	MTBE EPA 8020 µg/L	MTBE EPA 8240 µg/L	TRPH EPA 418.1 µg/L	TPHD LUFT Method µg/L	Dissolved Oxygen mg/L	Purged/ Not Purged
MW-1	03-17-95	22.26	6.57	15.69	ND	120,000	5,300	370	1,500	13,000	--	--	48,000	6,200*		
MW-1	06-01-95	22.26	7.87	14.39	ND	250,000	7,100	950	3,500	21,000	--	--	38,000	190,000*		
MW-1	08-31-95	22.26	8.12	** 14.15	0.01	Not sampled: well contained floating product										
MW-1	11-27-95	22.26	8.42	13.84	Sheen	310,000	4,600	770	5,700	21,000	--	--	--	--		
MW-1	02-22-96	22.26	6.01	** 16.26	0.01	100,000	6,200	320	2,500	12,000	<1,000*	--	--	--		
MW-1	05-20-96	22.26	7.03	15.23	ND	340,000	6,600	240	4,500	22,000	<1,000	--	150	<2,500*		
MW-1	08-26-96	22.26	8.16	14.10	ND	210,000	7,900	320	3,400	15,000	<1,000	--	--	--		
MW-1	11-20-96	22.26	7.84	14.42	ND	62,000	5,900	77	2,000	7,700	<300	--	--	--		
MW-1	03-24-97	19.19	8.05	11.14	ND	170,000	6,500	<200	2,400	9,900	<1,000	--	--	--		
MW-1	05-23-97	19.19	8.42	10.77	ND	83,000	6,200	84	2,500	9,000	<300	--	--	--		
MW-1	08-19-97	19.19	8.65	10.54	ND	83,000	4,500	<100	2,200	8,100	<600	--	--	--		
MW-1	11-19-97	19.19	8.54	10.65	ND	250,000	4,400	<500	3,800	9,900	<3,000	--	--	--		
MW-1	02-19-98	19.19	5.57	13.62	ND	74,000	2,500	120	2,200	4,100	<300	--	--	--		
MW-1	04-23-98	19.19	6.92	12.27	ND	210,000	2,700	<500	4,200	8,300	<3,000	--	--	--	1.5	P
MW-1	07-27-98	19.19	8.14	11.05	ND	73,000	2,100	88	2,600	4,600	<300	--	--	--	1.0	P
MW-1	10-14-98	19.19	8.58	10.61	ND	47,000	2,900	<50	2,300	3,900	<300	--	--	--	1.5	P
MW-2	03-17-95	21.33	6.12	15.21	ND	10,000	460	77	260	550	--	--	--	--		
MW-2	06-01-95	21.33	6.56	14.77	ND	13,000	400	78	210	410	--	--	--	--		
MW-2	08-31-95	21.33	7.18	14.15	ND	5,000	280	18	120	140	<50	--	--	--		
MW-2	11-27-95	21.33	7.39	13.94	ND	3,200	230	12	77	90	--	--	--	--		
MW-2	02-22-96	21.33	5.78	15.55	ND	11,000	290	67	190	330	<50	--	--	--		
MW-2	05-20-96	21.33	6.27	15.06	ND	Not sampled: well sampled annually, during the first quarter										
MW-2	08-26-96	21.33	7.30	14.03	ND	Not sampled: well sampled annually, during the first quarter										
MW-2	11-20-96	21.33	7.28	14.05	ND	Not sampled: well sampled annually, during the first quarter										
MW-2	03-24-97	21.12	7.11	14.01	ND	4,800	570	6	71	32	67	--	--	--		
MW-2	05-23-97	21.12	7.44	13.68	ND	Not sampled: well sampled annually, during the first quarter										
MW-2	08-19-97	21.12	7.64	13.48	ND	Not sampled: well sampled annually, during the first quarter										
MW-2	11-19-97	21.12	7.70	13.42	ND	Not sampled: well sampled annually, during the first quarter										
MW-2	02-19-98	21.12	5.22	15.90	ND	2,000	160	50	66	230	25	--	--	--		
MW-2	04-23-98	21.12	6.24	14.88	ND	Not sampled: well sampled annually, during the first quarter										
MW-2	07-27-98	21.12	7.02	14.10	ND	Not sampled: well sampled annually, during the first quarter										
MW-2	10-14-98	21.12	7.54	13.58	ND	Not sampled: well sampled annually, during the first quarter										

Table 1
Groundwater Elevation and Analytical Data
Petroleum Hydrocarbons and Their Constituents
1995 - Present****

ARCO Service Station 601
712 Lewelling Boulevard, San Leandro, California

Well Designation	Water Level Field Date	Top of Casing Elevation ft-MSL	Depth to Water feet	Groundwater Elevation ft-MSL	Floating Product Thickness feet	TPHG LUFT Method µg/L	Benzene EPA 8020 µg/L	Toluene EPA 8020 µg/L	Ethylbenzene EPA 8020 µg/L	Total Xylenes EPA 8020 µg/L	MTBE EPA 8020 µg/L	MTBE EPA 8240 µg/L	TRPH EPA 418.1 µg/L	TPHD LUFT Method µg/L	Dissolved Oxygen mg/L	Purged/ Not Purged
MW-3	03-17-95	20.11	5.46	14.65	ND	370,000	4,800	12,000	5,800	34,000	--	--	--	--		
MW-3	06-01-95	20.11	6.34	13.77	ND	270,000	6,000	11,000	5,200	28,000	--	--	--	--		
MW-3	08-31-95	20.11	6.60	** 13.52	0.02	Not sampled: well contained floating product										
MW-3	11-27-95	20.11	6.76	** 13.36	0.01	150,000	5,100	8,800	3,900	21,000	--	--	--	--		
MW-3	02-22-96	20.11	5.14	** 14.98	0.01	150,000	4,400	7,600	4,100	22,000	<3,000	--	--	--		
MW-3	05-20-96	20.11	5.17	14.94	ND	410,000	4,700	8,000	6,300	36,000	<3,000	--	--	--		
MW-3	08-26-96	20.11	7.04	13.07	ND	260,000	4,000	6,100	4,200	24,000	<2,000	--	--	--		
MW-3	11-20-96	20.11	6.26	13.85	ND	190,000	3,200	5,800	3,300	20,000	<1,000	--	--	--		
MW-3	03-24-97	22.99	6.94	16.05	ND	430,000	2,700	7,600	7,000	39,000	<5,000	--	--	--		
MW-3	05-23-97	22.99	6.98	16.01	ND	130,000	2,100	4,300	3,500	19,000	<700	--	--	--		
MW-3	08-19-97	22.99	7.25	15.74	ND	100,000	2,000	3,200	<100	19,000	<600	--	--	--		
MW-3	11-19-97	22.99	7.25	15.74	ND	93,000	1,700	2,400	2,800	16,000	<600	--	--	--		
MW-3	02-19-98	22.99	5.24	17.75	ND	80,000	620	1,200	2,500	13,000	<600	--	--	--	3.5	P
MW-3	04-23-98	22.99	6.60	16.39	ND	130,000	1,500	2,400	3,500	18,000	<600	--	--	--	1.0	P
MW-3	07-27-98	22.99	7.00	15.99	ND	140,000	920	1,500	2,400	13,000	<600	--	--	--	1.0	P
MW-3	10-14-98	22.99	7.04	15.95	ND	300,000	1,200	2,400	5,700	32,000	970	--	--	--		
MW-4	03-17-95	20.75	6.65	14.10	ND	16,000	1,800	970	310	2,500	--	--	--	--		
MW-4	06-01-95	20.75	7.25	13.50	ND	16,000	2,800	870	380	2,700	--	--	--	--		
MW-4	08-31-95	20.75	7.75	13.00	ND	9,000	2,000	270	270	1,400	<100	--	--	--		
MW-4	11-27-95	20.75	7.87	12.88	ND	3,800	890	130	130	550	--	--	--	--		
MW-4	02-22-96	20.75	7.29	13.46	ND	940	150	82	19	130	<20	--	--	--		
MW-4	05-20-96	20.75	7.30	13.45	ND	6,700	1,100	330	120	1,100	<100	--	--	--		
MW-4	08-26-96	20.75	7.57	13.18	ND	14,000	2,400	510	350	2,100	<100	--	--	--		
MW-4	11-20-96	20.75	7.89	12.86	ND	420	55	17	11	62	<3	--	--	--		
MW-4	03-24-97	22.38	6.90	15.48	ND	6,800	620	150	81	1,300	<50	--	--	--		
MW-4	05-23-97	22.38	7.80	14.58	ND	9,000	1,300	240	200	1,600	<60	--	--	--		
MW-4	08-19-97	22.38	-	NA	ND	Not sampled: well is dry										
MW-4	11-19-97	22.38	-	NA	ND	3700*	600	93	120	710	<60	--	--	--		
MW-4	02-19-98	22.38	6.78	15.60	ND	1,800	93	51	29	420	110	--	--	--	0.5	P
MW-4	04-23-98	22.38	6.47	15.91	ND	6,500	700	110	180	1,300	93	--	--	--	1.5	P
MW-4	07-27-98	22.38	7.22	15.16	ND	10,000	1,400	140	290	1,900	<120	--	--	--	1.0	P
MW-4	10-14-98	22.38	7.60	14.78	ND	6,500	900	63	200	1,200	63	--	--	--		

Table 1
Groundwater Elevation and Analytical Data
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ARCO Service Station 601
712 Lewelling Boulevard, San Leandro, California

Well Designation	Water Level Field Date	Top of Casing Elevation ft-MSL	Depth to Water feet	Groundwater Elevation ft-MSL	Floating Product Thickness feet	TPHG LUFT Method µg/L	Benzene EPA 8020 µg/L	Toluene EPA 8020 µg/L	Ethylbenzene EPA 8020 µg/L	Total Xylenes EPA 8020 µg/L	MTBE EPA 8020 µg/L	MTBE EPA 8240 µg/L	TRPH EPA 418.1 µg/L	TPHD LUFT Method µg/L	Dissolved Oxygen mg/L	Purged/ Not Purged
MW-5	03-17-95	20.90	5.51	15.39	ND	48,000	6,400	2,000	740	5,100	--	--	--	--		
MW-5	06-01-95	20.90	6.55	14.35	ND	76,000	11,000	5,400	1,400	7,700	--	--	--	--		
MW-5	08-31-95	20.90	6.80	14.10	ND	53,000	12,000	1,600	1,000	6,000	<500	--	--	--		
MW-5	11-27-95	20.90	7.13	13.77	ND	43,000	7,900	3,300	950	4,900	--	--	--	--		
MW-5	02-22-96	20.90	5.12	15.78	ND	52,000	9,100	3,300	940	5,000	<500	--	--	--		
MW-5	05-20-96	20.90	5.87	15.03	ND	55,000	9,300	3,800	1,100	5,400	<500	--	--	--		
MW-5	08-26-96	20.90	7.15	13.75	ND	47,000	5,300	2,100	780	3,200	<300	--	--	--		
MW-5	11-20-96	20.90	6.88	14.02	ND	53,000	8,700	5,700	920	4,400	<500	--	--	--		
MW-5	03-24-97	22.45	7.13	15.32	ND	39,000	8,200	3,200	720	3,100	<500	--	--	--		
MW-5	05-23-97	22.45	7.42	15.03	ND	29,000	6,600	1,700	400	1,500	<600	--	--	--		
MW-5	08-19-97	22.45	7.58	14.87	ND	16,000	4,600	790	<50	1,300	<300	--	--	--		
MW-5	11-19-97	22.45	7.58	14.87	ND	22,000	5,800	1,300	380	1,300	<300	--	--	--		
MW-5	02-19-98	22.45	4.65	17.80	ND	40,000	5,100	3,800	620	2,900	<300	--	--	--		
MW-5	04-23-98	22.45	6.25	16.20	ND	45,000	8,000	4,000	970	4,200	<600	--	--	--	1.6	P
MW-5	07-27-98	22.45	6.71	15.74	ND	30,000	8,000	2,000	590	1,900	<600	--	--	--	1.5	P
MW-5	10-14-98	22.45	7.19	15.26	ND	33,000	7,400	1,900	550	1,700	<300	--	--	--	1.5	P
MW-6	03-17-95	22.08	6.66	15.42	ND	45,000	9,300	<100	1,900	3,600	--	--	--	--		
MW-6	06-01-95	22.08	7.60	14.48	ND	23,000	5,600	<50	1,300	1,900	--	--	--	--		
MW-6	08-31-95	22.08	7.92	14.16	ND	26,000	8,000	<100	1,900	900	<500	--	--	--		
MW-6	11-27-95	22.08	8.21	13.87	ND	6,700	1,800	<20	480	230	--	--	--	--		
MW-6	02-22-96	22.08	6.21	15.87	ND	17,000	3,100	69	810	1,500	<300	--	--	--		
MW-6	05-20-96	22.08	7.07	15.01	ND	16,000	3,700	<50	1,100	1,100	<300	--	--	--		
MW-6	08-26-96	22.08	7.93	14.15	ND	23,000	5,800	<50	2,000	560	<300	--	--	--		
MW-6	11-20-96	22.08	8.02	14.06	ND	11,000	3,300	<50*	480	370	<300	--	--	--		
MW-6	03-24-97	22.77	7.95	14.82	ND	9,700	1,900	<20	800	270	<100	--	--	--		
MW-6	05-23-97	22.77	8.17	14.60	ND	16,000	4,300	<50	1,400	180	<300	--	--	--		
MW-6	08-19-97	22.77	-	NA	ND	Not sampled: well is dry										
MW-6	11-19-97	22.77	-	NA	ND	Not sampled: well is dry										
MW-6	02-19-98	22.77	5.78	16.99	ND	2,600	540	8	90	88	<30	--	--	--	0.5	P
MW-6	04-23-98	22.77	6.83	15.94	ND	7,600	1,300	13	520	190	<60	--	--	--	1.0	P
MW-6	07-27-98	22.77	7.80	14.97	ND	15,000	3,600	<25	1,100	230	<150	--	--	--	2.0	P
MW-6	10-14-98	22.77	8.31	14.46	ND	8,700	2,400	<20	220	36	<120	--	--	--		

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MW-7	03-17-95	22.89	7.68	15.21	ND	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--		
MW-7	06-01-95	22.89	8.40	14.49	ND	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--		
MW-7	08-31-95	22.89	9.09	13.80	ND	<50	<0.5	<0.5	0.6	<0.5	<3	--	--	--		
MW-7	11-27-95	22.89	9.15	13.74	ND	<50	<0.5	<0.5	0.9	<0.5	--	--	--	--		
MW-7	02-22-96	22.89	7.44	15.45	ND	110	1.4	<0.5	3.8	3.0	<3	--	--	--		
MW-7	05-20-96	22.89	8.47	14.42	ND	Not sampled: well sampled annually, during the first quarter										
MW-7	08-26-96	22.89	8.81	14.08	ND	Not sampled: well sampled annually, during the first quarter										
MW-7	11-20-96	22.89	9.17	13.72	ND	Not sampled: well sampled annually, during the first quarter										
MW-7	03-24-97	22.89	8.31	14.58	ND	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	--		
MW-7	05-23-97	22.89	9.26	13.63	ND	Not sampled: well sampled annually, during the first quarter										
MW-7	08-19-97	22.89	-	NA	ND	Not sampled: well is dry										
MW-7	11-19-97	22.89	-	NA	ND	Not sampled: well is dry										
MW-7	02-19-98	22.89	6.13	16.76	ND	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	--	0.5	P
MW-7	04-23-98	22.89	7.44	15.45	ND	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	--	1.5	P
MW-7	07-27-98	22.89	8.75	14.14	ND	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	--	1.5	P
MW-7	10-14-98	22.89	9.22	13.67	ND	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	--		
MW-8	03-17-95	20.97	6.14	14.83	ND	5,400	<5	<5	35	<5	--	--	--	--		
MW-8	06-01-95	20.97	6.50	14.47	ND	2,600	<2.5	<2.5	15	<2.5	--	--	--	--		
MW-8	08-31-95	20.97	7.35	13.62	ND	1,400	<3	<3	5	<3	520	--	900	--		
MW-8	11-27-95	20.97	7.60	13.37	ND	620	<0.5	<0.5	<0.5	0.5	--	560	900	510*		
MW-8	02-22-96	20.97	5.35	15.62	ND	5,800	<5	<5	28	<5	110	--	1,900	6,800*		
MW-8	05-20-96	20.97	5.92	15.05	ND	6,100	<5	<5	26	<5	240	--	--	--		
MW-8	08-26-96	20.97	7.08	13.89	ND	970	<1	<1	3	<1	710	--	--	--		
MW-8	11-20-96	20.97	7.01	13.96	ND	3,900	<2.5	<2.5	12	<2.5	930	--	--	--		
MW-8	03-24-97	20.89	7.33	13.56	ND	1,400	<10	<10	<10	12	1,300	--	--	--		
MW-8	05-23-97	20.89	7.55	13.34	ND	730	<5	<5	<5	<5	630	--	--	--		
MW-8	08-19-97	20.89	7.87	13.02	ND	<500	<5	<5	<5	<5	290	--	--	--		
MW-8	11-19-97	20.89	7.87	13.02	ND	<200	<2	<2	<2	<2	260	--	--	--		
MW-8	02-19-98	20.89	4.46	16.43	ND	2,000	<2	<2	9	<2	140	--	--	--		
MW-8	04-23-98	20.89	6.35	14.54	ND	4,500	<5	<5	<5	11	590	--	--	--	0.5	P
MW-8	07-27-98	20.89	7.43	13.46	ND	Not sampled										
MW-8	10-14-98	20.89	7.79	13.10	ND	Not sampled										

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MW-9	03-17-95	20.89	6.94	13.95	ND	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--		
MW-9	06-01-95	20.89	8.15	12.74	ND	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--		
MW-9	08-31-95	20.89	8.10	12.79	ND	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	--		
MW-9	11-27-95	20.89	8.38	12.51	ND	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--		
MW-9	02-22-96	20.89	7.36	13.53	ND	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	--		
MW-9	05-20-96	20.89	7.81	13.08	ND	Not sampled: well sampled semi-annually, during the first and third quarters										
MW-9	08-26-96	20.89	8.00	12.89	ND	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	--		
MW-9	11-20-96	20.89	7.06	13.83	ND	Not sampled: well sampled semi-annually, during the first and third quarters										
MW-9	03-24-97	22.26	7.74	14.52	ND	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	--		
MW-9	05-23-97	22.26	8.28	13.98	ND	Not sampled: well sampled semi-annually, during the first and third quarters										
MW-9	08-19-97	22.26	8.32	13.94	ND	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	--		
MW-9	11-19-97	22.26	8.32	13.94	ND	Not sampled: well sampled semi-annually, during the first and third quarters										
MW-9	02-19-98	22.26	7.11	15.15	ND	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	--		
MW-9	04-23-98	22.26	8.18	14.08	ND	Not sampled: well sampled semi-annually, during the first and third quarters										
MW-9	07-27-98	22.26	7.97	14.29	ND	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	--	3.6	P
MW-9	10-14-98	22.26	8.29	13.97	ND	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	--	2.5	P
MW-10	03-17-95	21.12	6.26	14.86	ND	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--		
MW-10	06-01-95	21.12	7.63	13.49	ND	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--		
MW-10	08-31-95	21.12	8.17	12.95	ND	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	--		
MW-10	11-27-95	21.12	8.38	12.74	ND	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--		
MW-10	02-22-96	21.12	5.41	15.71	ND	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	--		
MW-10	05-20-96	21.12	6.78	14.34	ND	Not sampled: well sampled semi-annually, during the first and third quarters										
MW-10	08-26-96	21.12	8.00	13.12	ND	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	--		
MW-10	11-20-96	21.12	7.81	13.31	ND	Not sampled: well sampled semi-annually, during the first and third quarters										
MW-10	03-24-97	21.33	7.87	13.46	ND	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	--		
MW-10	05-23-97	21.33	8.33	13.00	ND	Not sampled: well sampled semi-annually, during the first and third quarters										
MW-10	08-19-97	21.33	8.39	12.94	ND	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	--		
MW-10	11-19-97	21.33	8.39	12.94	ND	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	--		
MW-10	02-19-98	21.33	4.65	16.68	ND	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	--	0.5	P
MW-10	04-23-98	21.33	6.28	15.05	ND	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	--	3.3	P
MW-10	07-27-98	21.33	7.97	13.36	ND	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	--	1.0	P
MW-10	10-14-98	21.33	8.41	12.92	ND	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	--		

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MW-11	03-17-95	22.38	6.94	15.44	ND	100	<0.5	<0.5	<0.5	<0.5	--	--	--	--		
MW-11	06-01-95	22.38	7.90	14.48	ND	210	<0.5	<0.5	0.9	0.7	--	--	--	--		
MW-11	08-31-95	22.38	8.18	14.20	ND	680	<0.5	<0.5	4	1.8	<3	--	--	--		
MW-11	11-27-95	22.38	8.48	13.90	ND	340	<0.5	<0.5	2.2	1.6	--	--	--	--		
MW-11	02-22-96	22.38	6.63	15.75	ND	150	<0.5	<0.5	<0.8	0.8	<3	--	--	--		
MW-11	05-20-96	22.38	7.25	15.13	ND Not sampled: well sampled annually, during the first quarter											
MW-11	08-26-96	22.38	8.22	14.16	ND Not sampled: well sampled annually, during the first quarter											
MW-11	11-20-96	22.38	8.37	14.01	ND Not sampled: well sampled annually, during the first quarter											
MW-11	03-24-97	20.97	8.15	12.82	ND	63	<0.5	<0.5	<0.5	<0.5	<3	--	--	--		
MW-11	05-23-97	20.97	8.48	12.49	ND Not sampled: well sampled annually, during the first quarter											
MW-11	08-19-97	20.97	8.67	12.30	ND Not sampled: well sampled annually, during the first quarter											
MW-11	11-19-97	20.97	8.67	12.30	ND Not sampled: well sampled annually, during the first quarter											
MW-11	02-19-98	20.97	6.25	14.72	ND	<50	<0.5	1.6	<0.5	1.8	7	--	--	--		
MW-11	04-23-98	20.97	7.23	13.74	ND Not sampled: well sampled annually, during the first quarter											
MW-11	07-27-98	20.97	8.05	12.92	ND Not sampled: well sampled annually, during the first quarter											
MW-11	10-14-98	20.97	8.58	12.39	ND Not sampled: well sampled annually, during the first quarter											
MW-12	03-17-95	22.77	7.09	15.68	ND	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--		
MW-12	06-01-95	22.77	8.40	14.37	ND Not sampled: well sampled semi-annually, during the first and third quarters											
MW-12	08-31-95	22.77	8.55	14.22	ND	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	--		
MW-12	11-27-95	22.77	8.95	13.82	ND Not sampled: well sampled semi-annually, during the first and third quarters											
MW-12	02-22-96	22.77	6.81	15.96	ND	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	--		
MW-12	05-20-96	22.77	7.56	15.21	ND Not sampled: well sampled annually, during the first quarter											
MW-12	08-26-96	22.77	8.63	14.14	ND Not sampled: well sampled annually, during the first quarter											
MW-12	11-20-96	22.77	8.38	14.39	ND Not sampled: well sampled annually, during the first quarter											
MW-12	03-24-97	20.11	8.75	11.36	ND	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	--		
MW-12	05-23-97	20.11	8.92	11.19	ND Not sampled: well sampled annually, during the first quarter											
MW-12	08-19-97	20.11	9.20	10.91	ND Not sampled: well sampled annually, during the first quarter											
MW-12	11-19-97	20.11	9.20	10.91	ND Not sampled: well sampled annually, during the first quarter											
MW-12	02-19-98	20.11	6.28	13.83	ND	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	--		
MW-12	04-23-98	20.11	7.52	12.59	ND Not sampled: well sampled annually, during the first quarter											
MW-12	07-27-98	20.11	8.52	11.59	ND Not sampled: well sampled annually, during the first quarter											
MW-12	10-14-98	20.11	9.06	11.05	ND Not sampled: well sampled annually, during the first quarter											

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Table 1
Groundwater Elevation and Analytical Data
Petroleum Hydrocarbons and Their Constituents
1995 - Present***

ARCO Service Station 601
712 Lewelling Boulevard, San Leandro, California

Well Designation	Water Level Field Date	Top of Casing Elevation ft-MSL	Depth to Water feet	Groundwater Elevation ft-MSL	Floating Product Thickness feet	TPHG LUFT Method µg/L	Benzene EPA 8020 µg/L	Toluene EPA 8020 µg/L	Ethylbenzene EPA 8020 µg/L	Total Xylenes EPA 8020 µg/L	MTBE EPA 8020 µg/L	MTBE EPA 8240 µg/L	TRPH EPA 418.1 µg/L	TPHD LUFT Method µg/L	Dissolved Oxygen mg/L	Purged/ Not Purged	
MW-13	03-17-95	22.45	6.91	15.54	ND	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--			
MW-13	06-01-95	22.45	7.72	14.73	ND	Not sampled: well sampled annually, during the first quarter											
MW-13	08-31-95	22.45	7.58	14.87	ND	Not sampled: well sampled annually, during the first quarter											
MW-13	11-27-95	22.45	7.98	14.47	ND	Not sampled: well sampled annually, during the first quarter											
MW-13	02-22-96	22.45	6.71	15.74	ND	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	--			
MW-13	05-20-96	22.45	6.98	15.47	ND	Not sampled: well sampled annually, during the first quarter											
MW-13	08-26-96	22.45	7.85	14.60	ND	Not sampled: well sampled annually, during the first quarter											
MW-13	11-20-96	22.45	7.76	14.69	ND	Not sampled: well sampled annually, during the first quarter											
MW-13	03-24-97	20.75	7.85	12.90	ND	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	--			
MW-13	05-23-97	20.75	8.16	12.59	ND	Not sampled: well sampled annually, during the first quarter											
MW-13	08-19-97	20.75	8.40	12.35	ND	Not sampled: well sampled annually, during the first quarter											
MW-13	11-19-97	20.75	8.40	12.35	ND	Not sampled: well sampled annually, during the first quarter											
MW-13	02-19-98	20.75	6.44	14.31	ND	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	--			
MW-13	04-23-98	20.75	6.80	13.95	ND	Not sampled: well sampled annually, during the first quarter											
MW-13	07-27-98	20.75	7.52	13.23	ND	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	--	1.5	P	
MW-13	10-14-98	20.75	8.15	12.60	ND	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	--	2.0	P	
MW-14	03-17-95	22.99	8.17	14.82	ND	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--			
MW-14	06-01-95	22.99	8.57	14.42	ND	Not sampled: well sampled annually, during the first quarter											
MW-14	08-31-95	22.99	9.05	13.94	ND	Not sampled: well sampled annually, during the first quarter											
MW-14	11-27-95	22.99	9.19	13.80	ND	Not sampled: well sampled annually, during the first quarter											
MW-14	02-22-96	22.99	6.52	16.47	ND	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	--			
MW-14	05-20-96	22.99	7.88	15.11	ND	Not sampled: well sampled annually, during the first quarter											
MW-14	08-26-96	22.99	8.83	14.16	ND	Not sampled: well sampled annually, during the first quarter											
MW-14	11-20-96	22.99	8.95	14.04	ND	Not sampled: well sampled annually, during the first quarter											
MW-14	03-24-97	20.90	8.98	11.92	ND	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	--			
MW-14	05-23-97	20.90	9.61	11.29	ND	Not sampled: well sampled annually, during the first quarter											
MW-14	08-19-97	20.90	9.80	11.10	ND	Not sampled: well sampled annually, during the first quarter											
MW-14	11-19-97	20.90	9.80	11.10	ND	<50	1.7	<0.5	0.6	3	<3						
MW-14	02-19-98	20.90	6.27	14.63	ND	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	--			
MW-14	04-23-98	20.90	7.75	13.15	ND	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	--	0.5	P	
MW-14	07-27-98	20.90	9.24	11.66	ND	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	--	1.0	P	
MW-14	10-14-98	20.90	9.73	11.17	ND	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	--	1.0	P	

Table 1
Groundwater Elevation and Analytical Data
Petroleum Hydrocarbons and Their Constituents
1995 - Present****

ARCO Service Station 601
712 Lewelling Boulevard, San Leandro, California

Well Designation	Water Level Field Date	Top of Casing Elevation ft-MSL	Depth to Water feet	Groundwater Elevation ft-MSL	Floating Product Thickness feet	TPHG LUFT Method µg/L	Benzene EPA 8020 µg/L	Toluene EPA 8020 µg/L	Ethylbenzene EPA 8020 µg/L	Total Xylenes EPA 8020 µg/L	MTBE EPA 8020 µg/L	MTBE EPA 8240 µg/L	TRPH EPA 418.1 µg/L	TPHD LUFT Method µg/L	Dissolved Oxygen mg/L	Purged/ Not Purged
MW-15	03-17-95	19.19	5.21	13.98	ND	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--		
MW-15	06-01-95	19.19	5.84	13.35	ND	Not sampled: well sampled semi-annually, during the first and third quarters										
MW-15	08-31-95	19.19	6.18	13.01	ND	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	--		
MW-15	11-27-95	19.19	6.42	12.77	ND	Not sampled: well sampled semi-annually, during the first and third quarters										
MW-15	02-22-96	19.19	4.84	14.35	ND	<50	<0.5	<0.5	<0.5	<0.5	12	--	--	--		
MW-15	05-20-96	19.19	5.31	13.88	ND	Not sampled: well sampled semi-annually, during the first and third quarters										
MW-15	08-26-96	19.19	6.05	13.14	ND	<50	<0.5	<0.5	<0.5	<0.5	8	--	--	--		
MW-15	11-20-96	19.19	5.46	13.73	ND	Not sampled: well sampled semi-annually, during the first and third quarters										
MW-15	03-24-97	22.08	6.00	16.08	ND	<50	<0.5	<0.5	<0.5	<0.5	15	--	--	--		
MW-15	05-23-97	22.08	6.25	15.83	ND	Not sampled: well sampled semi-annually, during the first and third quarters										
MW-15	08-19-97	22.08	6.34	15.74	ND	99*	<0.5	<0.5	<0.5	0.7	6	--	--	--		
MW-15	11-19-97	22.08	6.34	15.74	ND	Not sampled: well sampled semi-annually, during the first and third quarters										
MW-15	02-19-98	22.08	4.66	17.42	ND	<50	<0.5	<0.5	<0.5	<0.5	48	--	--	--		
MW-15	04-23-98	22.08	5.18	16.90	ND	Not sampled: well sampled semi-annually, during the first and third quarters										
MW-15	07-27-98	22.08	6.02	16.06	ND	<50	<0.5	<0.5	<0.5	<0.5	50	--	--	--	1.0	P
MW-15	10-14-98	22.08	6.26	15.82	ND	<50	<0.5	<0.5	<0.5	<0.5	27	--	--	--	1.5	P

ft-MSL: elevation in feet, relative to mean sea level
MWN: ground-water flow direction and gradient apply to the entire monitoring well network
ft/ft: foot per foot
TPHG: total petroleum hydrocarbons as gasoline, California DHS LUFT Method
µg/L: micrograms per liter
mg/L: milligrams per liter
MTBE: Methyl tert-butyl ether
TRPH: total recoverable petroleum hydrocarbons
TPHD: total petroleum hydrocarbons as diesel, California DHS LUFT Method
NR: not reported; data not available or not measurable
ND: none detected
DRY: dry well; groundwater was not detected
- - : not analyzed
*: Sample contains a higher boiling point hydrocarbon mixture quantitated as gasoline. The chromatogram did not match the typical gasoline fingerprint.
**: [corrected elevation (Z')] = Z + (h * 0.73) where: Z = measured elevation, h = floating product thickness, 0.73 = density ratio of oil to water
***: For previous historical groundwater elevation and analytical data please refer to *Fourth Quarter 1995 Groundwater Monitoring Program Results, ARCO Service Station* 601, San Leandro, California, (EMCON, March 14, 1996).

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Table 2
Groundwater Flow Direction and Gradient

ARCO Service Station No. 601
712 Lewelling Boulevard, San Leandro, California

Date Measured	Average Flow Direction	Average Hydraulic Gradient
03/17/95	West-Southwest	0.006
06/01/95	Southwest	0.003
08/31/95	South-Southwest	0.005
11/27/95	South-Southwest	0.004
02/22/96	Northwest	0.007
05/20/96	Southwest	0.007
08/26/96	South-Southwest	0.004
11/20/96	South-Southeast	0.004
03/24/97	Southeast	0.013
05/23/97	Southeast	0.014
08/19/97	Southeast	0.04
11/19/97	Southeast	0.016
02/19/98	East	Variable
04/23/98	Variable	Variable
07/27/98	Southeast	0.05
10/14/98	**Southeast**	**0.02**

Table 3
Historical Groundwater Analytical Data
Metals*
1995 - Present**

ARCO Service Station 601
712 Lewelling Boulevard, San Leandro, California

Well Designation	Water Sample FieldDate	Cadmium EPA 6010 µg/L	Chromium EPA 6010 µg/L	Lead EPA 7421 µg/L	Nickel EPA 6010 µg/L	Zinc EPA 6010 µg/L
MW-1	03-17-95	<5	20	20	<40	60
MW-1	06-01-95	<5	20	22	70	100
MW-1	08-31-95	Not sampled: well contained floating product				
MW-1	11-27-95	Not sampled: well contained floating product				
MW-1	03-14-96	Not sampled: well contained floating product				
MW-1	05-21-96	0.006	<0.01	<0.005	<0.02	<0.02
MW-1	08-26-96	--	--	--	--	--
MW-1	11-20-96	--	--	--	--	--
MW-1	03-24-97	--	--	--	--	--
MW-1	05-23-97	Not analyzed: well MW-8 was sampled for additional parameters in lieu of well MW-1				
MW-1	08-19-97					
MW-1	11-19-97					
MW-1	02-19-98	<0.01	<0.01	<0.05	<0.02	<0.02
MW-1	04-23-98	--	--	--	--	--
MW-1	07-27-98	--	--	--	--	--
MW-1	10-14-98	--	--	--	--	--
MW-8	03-17-95	Not analyzed: well MW-1 was sampled for additional parameters in lieu of well MW-8				
MW-8	06-01-95	Not analyzed: well MW-1 was sampled for additional parameters in lieu of well MW-8				
MW-8	08-31-95	<5	40	16	50	90
MW-8	11-27-95	<5	130	77	170	280
MW-8	03-14-96	<5	30	7	40	60
MW-8	05-21-96	Not analyzed: well MW-1 was sampled for additional parameters in lieu of well MW-8				
MW-8	08-26-96	--	--	--	--	--
MW-8	11-20-96	--	--	--	--	--
MW-8	03-24-97	--	--	--	--	--
MW-8	05-23-97	<0.005	<0.01	<0.005	<0.02	<0.02
MW-8	08-19-97	--	--	--	--	--
MW-8	02-19-98	--	--	--	--	--
MW-8	04-23-98	--	--	--	--	--
MW-8	07-27-98	--	--	--	--	--
MW-8	10-14-98	--	--	--	--	--

EPA: United States Environmental Protection Agency
mg/L: micrograms per liter
- - : not analyzed
*: Historically samples were analyzed for total metals. Since March 14, 1996, the samples were filtered and analyzed for dissolved metals
**: For previous historical analytical data please refer to *Fourth Quarter 1995 Groundwater Monitoring Program Results, ARCO Service Station 601, San Leandro, California*, (EMCON, March 14, 1996).

Table 4
Historical Groundwater Analytical Data
Volatile and Semivolatile Organic Compounds
1995 - Present*

ARCO Service Station 601
712 Lewelling Boulevard, San Leandro, California

Well Designation	Water Sample FieldDate	Volatile Organic Compounds by EPA Method 601/8010 or 624/8240							Semivolatile Organic Compounds by EPA Method 3520/8270				
		Methylene Chloride µg/L	1,2-Dichloro-ethane µg/L	1,1-Dichloro-ethane µg/L	Benzene µg/L	Toluene µg/L	Ethylbenzene µg/L	Total Xylenes µg/L	Naphthalene µg/L	2-Methyl-naphthalene µg/L	Bis (2-ethylhexyl) Phthalate µg/L	Phenol µg/L	2,4-Di-methyl-phenol µg/L
MW-1	03-17-95	--	--	--	--	--	--	--	1300	730	<50	ND	150
MW-1	06-01-95	--	--	--	--	--	--	--	2200	1700	<100	240	<100
MW-1	08-31-95	Not sampled: well contained floating product											
MW-1	11-27-95	Not sampled: well contained floating product											
MW-1	03-14-96	Not sampled: well contained floating product											
MW-1	05-21-96	--	--	--	--	--	--	--	1200	860	<50	<50	<50
MW-1	08-26-96	--	--	--	--	--	--	--	2300	1800	<500	<500	<1000
MW-1	11-20-96	--	--	--	--	--	--	--	590	250	91	<50^	<100^
MW-1	03-24-97	--	--	--	--	--	--	--	730	610	<50^	<50^	<100^
MW-1	05-23-97	Not analyzed: well MW-8 was sampled for additional parameters in lieu of well MW-1											
MW-1	08-19-97	--	--	--	--	--	--	--	1300	790	<50^	<50^	<100^
MW-1	11-19-97	--	--	--	--	--	--	--	<5	<5	5	<5	<10
MW-1	02-19-98	--	--	--	--	--	--	--	870	330	<50	<50	<100
MW-1	04-23-98	Not analyzed											
MW-1	07-27-98	Not analyzed											
MW-1	10-14-98	Not analyzed											

Table 4
Historical Groundwater Analytical Data
Volatile and Semivolatile Organic Compounds
1995 - Present*

ARCO Service Station 601
712 Lewelling Boulevard, San Leandro, California

Well Designation	Water Sample FieldDate	Volatile Organic Compounds by EPA Method 601/8010 or 624/8240							Semivolatile Organic Compounds by EPA Method 3520/8270				
		Methylene Chloride µg/L	1,2-Dichloroethane µg/L	1,1-Dichloroethane µg/L	Benzene µg/L	Toluene µg/L	Ethylbenzene µg/L	Total Xylenes µg/L	Naphthalene µg/L	2-Methylnaphthalene µg/L	Bis (2-ethylhexyl) Phthalate µg/L	Phenol µg/L	2,4-Dimethylphenol µg/L
MW-8	03-17-95	Not analyzed: well MW-1 was sampled for additional parameters in lieu of well MW-8											
MW-8	06-01-95	Not analyzed: well MW-1 was sampled for additional parameters in lieu of well MW-8											
MW-8	08-31-95	--	--	--	--	--	--	--	62	8	<5	<5	<5
MW-8	11-27-95	--	--	--	--	--	--	--	15	<5	<5	<5	<5
MW-8	03-14-96	--	--	--	--	--	--	--	400	55	<50	<50	<50
MW-8	05-21-96	Not analyzed: well MW-1 was sampled for additional parameters in lieu of well MW-8											
MW-8	08-26-96	Not analyzed: well MW-1 was sampled for additional parameters in lieu of well MW-8											
MW-8	11-20-96	Not analyzed: well MW-1 was sampled for additional parameters in lieu of well MW-8											
MW-8	03-24-97	Not analyzed: well MW-1 was sampled for additional parameters in lieu of well MW-8											
MW-8	05-23-97	--	--	--	--	--	--	--	26	<5	<5	<5	<10
MW-8	08-19-97	Not analyzed: well MW-1 was sampled for additional parameters in lieu of well MW-8											
MW-8	11-19-97	Not analyzed: well MW-1 was sampled for additional parameters in lieu of well MW-8											
MW-8	02-19-98	Not analyzed: well MW-1 was sampled for additional parameters in lieu of well MW-8											
MW-8	04-23-98	Not analyzed											
MW-8	07-27-98	Not analyzed											
MW-8	10-14-98	Not analyzed											

EPA: United Statest Environmental Protection Agency

µg/L: micrograms per liter

- - : not analyzed

^: method reporting limit was raised due to: (1) high analyte concentration requiring sample dilution, or (2) matrix interference

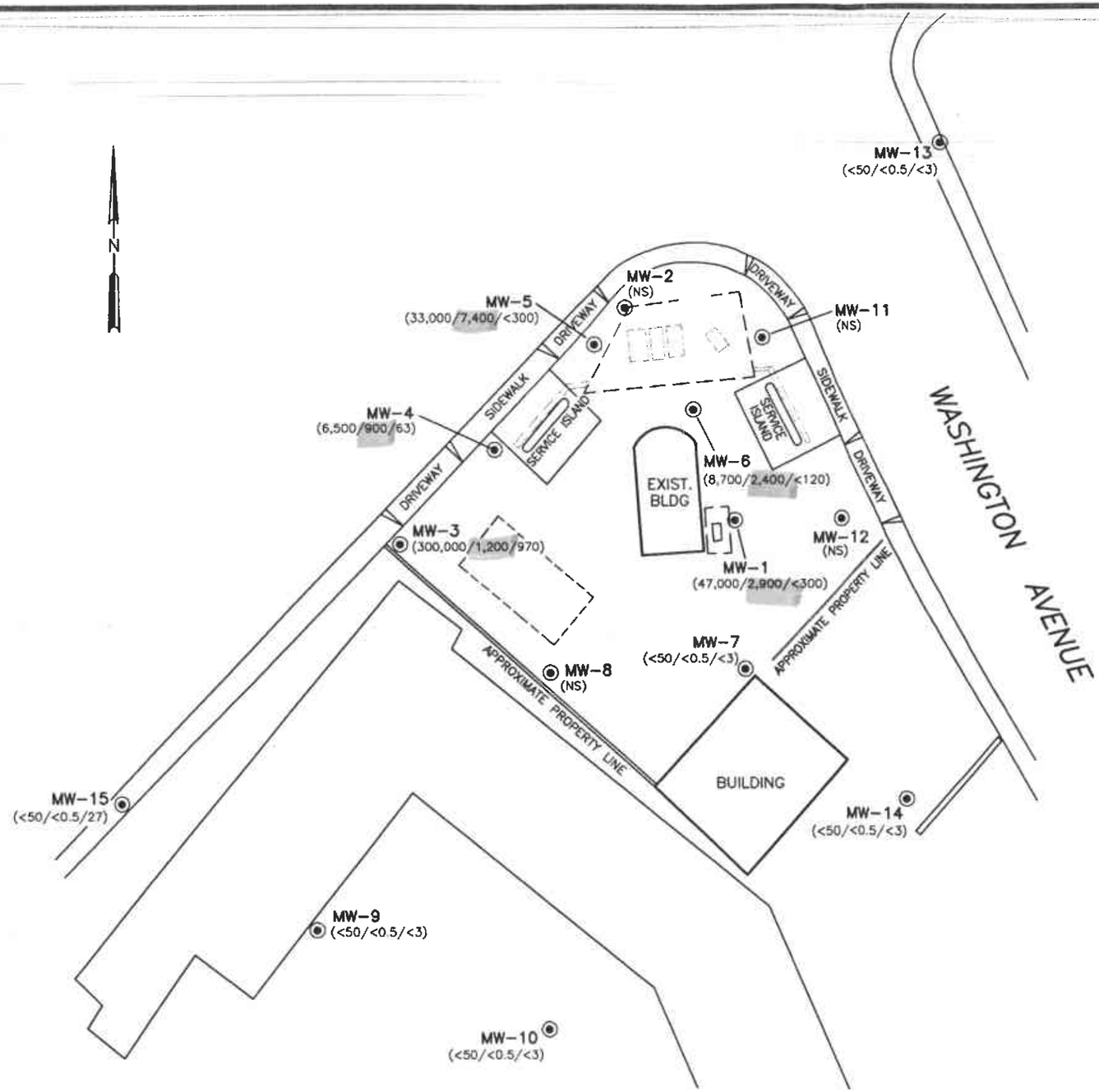
*: For previous historical analytical data please refer to *Fourth Quarter 1995 Groundwater Monitoring Program Results, ARCO Service Station 601, San Leandro, California,* (EMCON, March 14, 1996).

**: The sample was analyzed initially on 8/22/97, within the recommended holding time, and the surrogates were below normal CAS control limits. The sample was reextracted on 9/2/97, 7 days past the recommednded holding time, and the QA/QC results for reanalysis are within CAS acceptance criteria.

Table 5
Approximate Cumulative Floating Product Recovered

ARCO Service Station 601
712 Lewelling Boulevard, San Leandro, California

Well Designation	Date	Floating Product Recovered gallons
MW-1	1991	3.43
MW-1	1992	0.02
MW-1	1993	0.00
MW-1	1994	0.00
MW-1	1995	0.00
MW-1	1996	0.00
MW-1	1997	0.00
MW-1	1998	0.00
	1991 to 1998 Total:	3.45



EXPLANATION

- Groundwater monitoring well
- Former underground gasoline storage tank
- Existing underground gasoline storage tank
- Approximate limit of gasoline tank excavation
- Former product line
- (8,700/2,400/<120) Concentration of total petroleum hydrocarbons as gasoline (TPHG), benzene, and MTBE in groundwater (ug/L); samples collected 10/14/98
- < Not detected at or above the indicated laboratory detection limit
- NS Not sampled

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DATE JAN. 1999
DWN KAB
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PROJECT NO.
20805-121.006

FIGURE 1
ARCO PRODUCTS COMPANY
SERVICE STATION 601, 712 LEWELLING BLVD.
SAN LEANDRO, CALIFORNIA
GROUNDWATER ANALYTICAL SUMMARY
FOURTH QUARTER 1998

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IMAGE Files: <No Images>
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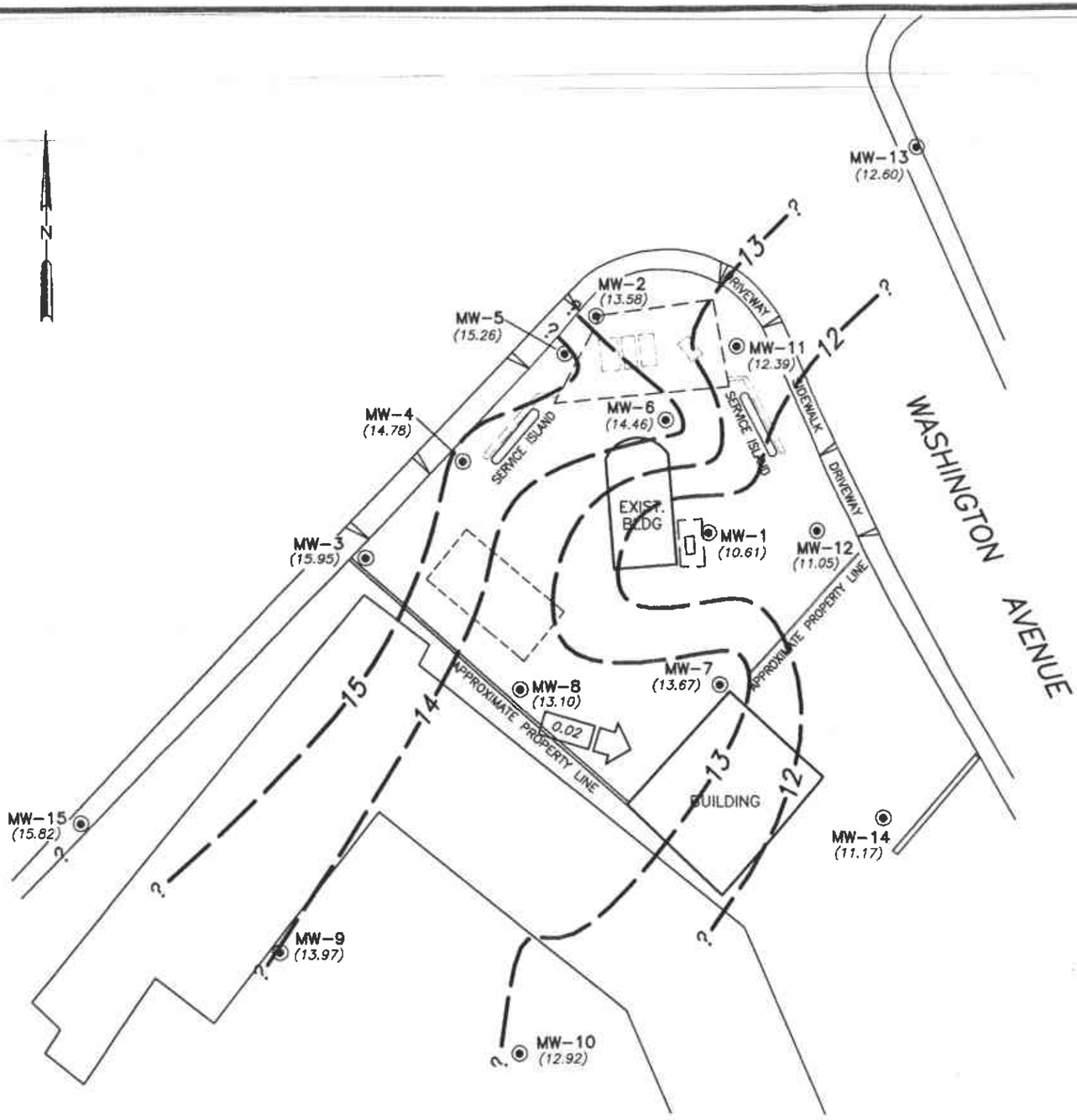
1" 1/2" 0" 1"



EXPLANATION

- Groundwater monitoring well
- Former underground gasoline storage tank
- Existing underground gasoline storage tank
- Approximate limit of gasoline tank excavation
- Former product line
- (11.05) Groundwater elevation (Ft.–MSL) measured 10/14/98
- Groundwater elevation contour (Ft.–MSL)
- Approximate direction of groundwater flow showing gradient

0 50 100

SCALE IN FEET
(Approximate)

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FIGURE 2
ARCO PRODUCTS COMPANY
SERVICE STATION 601, 712 LEWELLING BLVD.
SAN LEANDRO, CALIFORNIA
GROUNDWATER ELEVATION CONTOURS
FOURTH QUARTER 1998

IMAGE Files: <No Images>
XREF Files: <No Xrefs>
SANJOSE/CADD: N:\DWG\PINACL\601\601GWC.DWG Thu, 04/Feb/99 12:24pm kblock
Dimscale: 50 Ltscale: 50 Paltscale: 0
1" 1/2" 0" 1"

APPENDIX A

SAMPLING AND ANALYSIS PROCEDURES

APPENDIX A

SAMPLING AND ANALYSIS PROCEDURES

The sampling and analysis procedures for water quality monitoring programs are contained in this appendix. The procedures provided for consistent and reproducible sampling methods, proper application of analytical methods, and accurate and precise analytical results. Finally, these procedures provided guidelines so that the overall objectives of the monitoring program were achieved.

The following documents have been used as guidelines for developing these procedures:

- Procedures Manual for Groundwater Monitoring at Solid Waste Disposal Facilities, Environmental Protection Agency (EPA)-530/SW-611, August 1977
- Resource Conservation and Recovery Act (RCRA) Groundwater Monitoring Technical Enforcement Guidance Document, Office of Solid Waste and Emergency Response (OSWER) 9950.1, September 1986
- Test Methods for Evaluating Solid Waste: Physical/Chemical Methods, EPA SW-846, 3rd edition, November 1986
- Methods for Organic Chemical Analysis of Municipal and Industrial Waste Water, EPA-600/4-82-057, July 1982
- Methods for Organic Chemical Analysis of Water and Wastes, EPA-600/4-79-020, revised March 1983
- Leaking Underground Fuel Tank (LUFT) Field Manual, California State Water Resources Control Board, revised October 1989

Sample Collection

Sample collection procedures include equipment cleaning, water level and total well depth measurements, and well purging and sampling.

Equipment Cleaning

Before the sampling event was started, equipment that was used to sample groundwater was disassembled and cleaned with detergent water and then rinsed with deionized water. During field sampling, equipment surfaces that were placed in the well or came into contact with groundwater during field sampling were steam cleaned with deionized water before the next well was purged or sampled.

Water Level, Floating Hydrocarbon, and Total Well Depth Measurements

Before purging and sampling occurred, the depth to water, floating hydrocarbon thickness, and total well depth were measured using an oil/water interface measuring system. The oil/water interface measuring system consists of a probe that emits a continuous audible tone when immersed in a nonconductive fluid, such as oil or gasoline, and an intermittent tone when immersed in a conductive fluid, such as water. The floating hydrocarbon thickness and water level were measured by lowering the probe into the well. Liquid levels were recorded relative to the tone emitted at the groundwater surface. The sonic probe was decontaminated by being rinsed with deionized water or steam cleaned after each use. A bottom-filling, clear Teflon® bailer was used to verify floating hydrocarbon thickness measurements of less than 0.02 foot. Alternatively, an electric sounder and a bottom-filling Teflon bailer may have been used to record floating hydrocarbon thickness and depth to water.

The electric sounder is a transistorized instrument that uses a reel-mounted, two-conductor, coaxial cable that connects the control panel to the sensor. Cable markings are stamped at 1-foot intervals. The water level was measured by lowering the sensor into the monitoring well. A low-current circuit was completed when the sensor contacted the water, which served as an electrolyte. The current was amplified and fed into an indicator light and audible buzzer, signaling when water had been contacted. A sensitivity control compensated for highly saline or conductive water. The electric sounder was decontaminated by being rinsed with deionized water after each use. The bailer was lowered to a point just below the liquid level, retrieved, and observed for floating hydrocarbon.

Liquid measurements were recorded to the nearest 0.01 foot on the depth to water/floating product survey form. The groundwater elevation at each monitoring well was calculated by subtracting the measured depth to water from the surveyed elevation of the top of the well casing. (Every attempt was made to measure depth to water for all wells on the same day.) Total well depth was then measured by lowering the sensor to the bottom of the well. Total well depth, used to calculate purge volumes and to determine whether the well screen was partially obstructed by silt, was recorded to the nearest 0.1 foot on the depth to water/floating product survey form.

Well Purging

If the depth to groundwater was above the top of screens of the monitoring wells, then the wells were purged. Before sampling occurred, a polyvinyl chloride (PVC) bailer, centrifugal pump, low-flow submersible pump, or Teflon bailer was used to purge standing water in the casing and gravel pack from the monitoring well. Monitoring wells were purged according to the protocol presented in Figure A-1. In most monitoring wells, the amount of water purged before sampling was greater than or equal to three casing volumes. Some monitoring wells were expected to be evacuated to dryness after removing fewer than three casing volumes. These low-yield monitoring wells were allowed to recharge for up to 24 hours. Samples were obtained as soon as the monitoring wells recharged to a level sufficient for sample collection. If insufficient water recharged after 24 hours, the monitoring well was recorded as dry for the sampling event.

Groundwater purged from the monitoring wells was transported in a 500-gallon water trailer, 55-gallon drum, or a 325-gallon truck-mounted tank to EMCON's San Jose or Sacramento office location for temporary storage. EMCON arranged for transport and disposal of the purged groundwater through Integrated Waste Stream Management, Inc.

Field measurements of pH, specific conductance, and temperature were recorded in a waterproof field logbook. Figure A-2 shows an example of the water sample field data sheet on which field data are recorded. Field data sheets were reviewed for completeness by the sampling coordinator after the sampling event was completed.

The pH, specific conductance, and temperature meter were calibrated each day before field activities were begun. The calibration was checked once each day to verify meter performance. Field meter calibrations were recorded on the water sample field data sheet.

Well Sampling

A Teflon bailer was the only equipment acceptable for well sampling. When samples for volatile organic analysis were being collected, the flow of groundwater from the bailer was regulated to minimize turbulence and aeration. Glass bottles of at least 40-milliliters volume and fitted with Teflon-lined septa were used in sampling for volatile organics. These bottles were filled completely to prevent air from remaining in the bottle. A positive meniscus formed when the bottle was completely full. A convex Teflon septum was placed over the positive meniscus to eliminate air. After the bottle was capped, it was inverted and tapped to verify that it contained no air bubbles. The sample containers for other parameters were filled, filtered as required, and capped.

When required, dissolved concentrations of metals were determined using appropriate field filtration techniques. The sample was filtered by emptying the contents of the Teflon bailer into a pressure transfer vessel. A disposable 0.45-micron acrylic copolymer filter was threaded onto the transfer vessel at the discharge point, and the vessel was sealed. Pressure was applied to the vessel with a hand pump and the filtrate directed into the appropriate containers. Each filter was used once and discarded.

Sample Preservation and Handling

The following section specifies sample containers, preservation methods, and sample handling procedures.

Sample Containers and Preservation

Sample containers vary with each type of analytical parameter. Container types and materials were selected to be nonreactive with the particular analytical parameter tested.

Sample Handling

Sample containers were labeled immediately prior to sample collection. Samples were kept cool with cold packs until received by the laboratory. At the time of sampling, each sample was logged on an ARCO chain-of-custody record that accompanied the sample to the laboratory.

Samples that required overnight storage prior to shipping to the laboratory were kept cool (4° C) in a refrigerator. The refrigerator was kept in a warehouse, which was locked when not occupied by an EMCON employee. A sample/refrigerator log was kept to record the date and time that samples were placed into and removed from the refrigerator.

Samples were transferred from EMCON to an ARCO-approved laboratory by courier or taken directly to the laboratory by the environmental sampler. Sample shipments from EMCON to laboratories performing the selected analyses routinely occurred within 24 hours of sample collection.

Sample Documentation

The following procedures were used during sampling and analysis to provide chain-of-custody control during sample handling from collection through storage. Sample documentation included the use of the following:

- Water sample field data sheets to document sampling activities in the field
- Labels to identify individual samples
- Chain-of-custody record sheets for documenting possession and transfer of samples
- Laboratory analysis request sheets for documenting analyses to be performed

Field Logbook

In the field, the sampler recorded the following information on the water sample field data sheet (see Figure A-2) for each sample collected:

- Project number
- Client's name
- Location
- Name of sampler
- Date and time
- Well accessibility and integrity
- Pertinent well data (e.g., casing diameter, depth to water, well depth)
- Calculated and actual purge volumes
- Purging equipment used
- Sampling equipment used
- Appearance of each sample (e.g., color, turbidity, sediment)
- Results of field analyses (temperature, pH, specific conductance)
- General comments

The water sample field data sheet was signed by the sampler and reviewed by the sampling coordinator.

Labels

Sample labels contained the following information:

- Project number
- Sample number (i.e., well designation)
- Sample depth
- Sampler's initials
- Date and time of collection
- Type of preservation used (if any)

Sampling and Analysis Chain-of-Custody Record

The ARCO chain-of-custody record initiated at the time of sampling contained, at a minimum, the sample designation (including the depth at which the sample was collected), sample type, analytical request, date of sampling, and the name of the sampler. The record sheet was signed, timed, and dated by the sampler when transferring the samples. The number of custodians in the chain of possession was minimized. A copy of the ARCO chain-of-custody record was returned to EMCON with the analytical results.

Groundwater Sampling and Analysis Request Form

A groundwater sampling and analysis request form (see Figure A-3) was used to communicate to the environmental sampler the requirements of the monitoring event. At a minimum, the groundwater sampling and analysis request form included the following information:

- Date scheduled
- Site-specific instructions
- Specific analytical parameters
- Well number
- Well specifications (expected total depth, depth of water, and product thickness)

MONITORING WELL PURGING PROTOCOL

OWT

MEASURE AND RECORD DEPTH TO WATER AND WELL TOTAL DEPTH

CHECK FOR FLOATING PRODUCT

YES

MEASURE AND DOCUMENT FLOATING PRODUCT THICKNESS. DO NOT SAMPLE WELL FOR DISSOLVED CONSTITUENTS.

NO

CALCULATE PURGE VOLUME BY USING THE FOLLOWING EQUATION:

$P = \pi r^2 h \times 7.48 \times 3$

where:

P = calculated purge volume (gallons)

$\pi = 3.14$

r = radius of well casing in feet

h = height of water column in feet

EVACUATE WATER FROM WELL EQUAL TO THE CALCULATED PURGE VOLUME WHILE MONITORING GROUNDWATER STABILIZATION INDICATOR PARAMETERS (pH, CONDUCTIVITY, TEMPERATURE) AT INTERVALS OF ONE CASING VOLUME.

WELL EVACUATED TO PRACTICAL LIMITS OF DRYNESS BEFORE REMOVING CALCULATED PURGE VOLUME

NO

FINAL TWO SETS OF GROUNDWATER STABILIZATION INDICATOR PARAMETER MEASUREMENTS MEET THE FOLLOWING CRITERIA:

pH = ± 0.1 pH units

COND. = ± 10 %

TEMP. = ± 1.0 °F

YES

WELL PURGING CRITERIA MET; PROCEED TO WELL SAMPLING.

NO

CONTINUE PURGING; EVACUATE ADDITIONAL CASING VOLUME OF WATER, MONITORING INDICATOR PARAMETERS FOR STABILITY.

YES

WELL RECHARGES TO A LEVEL SUFFICIENT FOR SAMPLE COLLECTION WITHIN 24 HOURS OF EVACUATION TO DRYNESS.

YES

FIELD TEST FIRST RECHARGE WATER FOR INDICATOR PARAMETERS, THEN PROCEED TO WELL SAMPLING.

NO

RECORD WELL AS DRY FOR PURPOSES OF SAMPLING.

EMCON

MONITORING WELL PURGING PROTOCOL

FIGURE

A-1

WATER SAMPLE FIELD DATA SHEET

Rev. 5/96

OWT

PROJECT NO : _____ SAMPLE ID : _____

PURGED BY : _____ CLIENT NAME : _____

SAMPLED BY : _____ LOCATION : _____

TYPE: Groundwater ____ Surface Water ____ Leachate ____ Other _____

CASING DIAMETER (inches): 2 ____ 3 ____ 4 ____ 4.5 ____ 6 ____ Other _____

CASING ELEVATION (feet/MSL) : _____ VOLUME IN CASING (gal.) : _____

DEPTH OF WELL (feet) : _____ CALCULATED PURGE (gal.) : _____

DEPTH OF WATER (feet) : _____ ACTUAL PURGE VOL. (gal.) : _____

DATE PURGED : _____ END PURGE : _____

DATE SAMPLED : _____ SAMPLING TIME : _____

TIME (2400 HR)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm@25°c)	TEMPERATURE (°F)	TURBIDITY (visual/NTU)	TIME (2400 HR)

OTHER: _____ ODOR: _____ (COBALT 0-100) (NTU 0-200)

FIELD QC SAMPLES COLLECTED AT THIS WELL (i.e. FB-1, XDUP-1) : _____

PURGING EQUIPMENT

____ 2" Bladder Pump ____ Bailer (Teflon)

____ Centrifugal Pump ____ Bailer (PVC)

____ Submersible Pump ____ Bailer (Stainless Steel)

____ Well Wizard™ ____ Dedicated

Other: _____

SAMPLING EQUIPMENT

____ 2" Bladder Pump ____ Bailer (Teflon)

____ Bomb Sampler ____ Bailer (Stainless Steel)

____ Dipper ____ Submersible Pump

____ Well Wizard™ ____ Dedicated

Other: _____

WELL INTEGRITY: _____ LOCK: _____

REMARKS: _____

pH, E.C., Temp. Meter Calibration: Date: _____ Time: _____ Meter Serial No.: _____

E.C. 1000 _____ / _____ pH 7 _____ / _____ pH 10 _____ / _____ pH 4 _____ / _____

Temperature °F _____

SIGNATURE: _____ REVIEWED BY: _____ PAGE _____ OF _____

EMCON

WATER SAMPLE FIELD DATA SHEET

FIGURE A-2

OWT

EMCON - SACRAMENTO
GROUNDWATER SAMPLING AND ANALYSIS REQUEST FORM

PROJECT NAME :

SCHEDULED DATE :

SPECIAL INSTRUCTIONS / CONSIDERATIONS :

Project Authorization: _____
EMCON Project No.: _____
OWT Project No.: _____
Task Code: _____
Originals To: _____
cc: _____

Well Lock Number (s)

☐ CHECK BOX TO AUTHORIZE DATA ENTRY

Site Contact: _____ Name _____ Phone #

Well Number or Source	Casing Diameter (inches)	Casing Length (feet)	Depth to Water (feet)	ANAYSES REQUESTED

Laboratory and Lab QC Istructions:

EMCON

SAMPLING AND ANALYSIS REQUEST FORM

FIGURE
A-3

APPENDIX B

CERTIFIED ANALYTICAL REPORTS, AND CHAIN-OF-CUSTODY DOCUMENTATION

Columbia Analytical Services INC.
An Employee-Owned Company

October 27, 1998

Service Request No.: S9802730

RECEIVED
OCT 29 1998
BY: a.m

Glen Vanderveen
PINNACLE
144 A Mayhew Wy.
Walnut Creek, CA 94596

RE: 20805-121.005/TO#22312.00/RAT8/601 SAN LEANDRO

Dear Mr. Vanderveen:

The following pages contain analytical results for sample(s) received by the laboratory on October 14, 1998. Results of sample analyses are followed by Appendix A which contains sample custody documentation and quality assurance deliverables requested for this project. The work requested has been assigned the Service Request No. listed above. To help expedite our service, please refer to this number when contacting the laboratory.

Analytical results were produced by procedures consistent with Columbia Analytical Services' (CAS) Quality Assurance Manual (with any deviations noted). Signature of this CAS Analytical Report below confirms that pages 2 through 18, following, have been thoroughly reviewed and approved for release in accord with CAS Standard Operating Procedure ADM-DatRev3.

Please feel welcome to contact me should you have questions or further needs.

Sincerely,

Steven L. Green
Project Chemist

Bernadette T. Cox for
Greg Anderson
Regional QA Coordinator

COLUMBIA ANALYTICAL SERVICES, Inc.
Acronyms

A2LA	American Association for Laboratory Accreditation
ASTM	American Society for Testing and Materials
BOD	Biochemical Oxygen Demand
BTEX	Benzene, Toluene, Ethylbenzene, Xylenes
CAM	California Assessment Metals
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
COD	Chemical Oxygen Demand
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DLCS	Duplicate Laboratory Control Sample
DMS	Duplicate Matrix Spike
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
IC	Ion Chromatography
ICB	Initial Calibration Blank sample
ICP	Inductively Coupled Plasma atomic emission spectrometry
ICV	Initial Calibration Verification sample
J	Estimated concentration. The value is less than the MRL, but greater than or equal to the MDL. If the value is equal to the MRL, the result is actually <MRL before rounding.
LCS	Laboratory Control Sample
LUFT	Leaking Underground Fuel Tank
M	Modified
MBAS	Methylene Blue Active Substances
MCL	Maximum Contaminant Level. The highest permissible concentration of a substance allowed in drinking water as established by the U. S. EPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
MS	Matrix Spike
MTBE	Methyl tert-Butyl Ether
NA	Not Applicable
NAN	Not Analyzed
NC	Not Calculated
NCASI	National Council of the paper industry for Air and Stream Improvement
ND	Not Detected at or above the method reporting/detection limit (MRL/MDL)
NIOSH	National Institute for Occupational Safety and Health
NTU	Nephelometric Turbidity Units
ppb	Parts Per Billion
ppm	Parts Per Million
PQL	Practical Quantitation Limit
QA/QC	Quality Assurance/Quality Control
RCRA	Resource Conservation and Recovery Act
RPD	Relative Percent Difference
SIM	Selected Ion Monitoring
SM	Standard Methods for the Examination of Water and Wastewater, 18th Ed., 1992
STLC	Solubility Threshold Limit Concentration
SW	Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, 3rd Ed., 1986 and as amended by Updates I, II, IIA, and IIB.
TCLP	Toxicity Characteristic Leaching Procedure
TDS	Total Dissolved Solids
TPH	Total Petroleum Hydrocarbons
tr	Trace level. The concentration of an analyte that is less than the PQL but greater than or equal to the MDL. If the value is equal to the PQL, the result is actually <PQL before rounding.
TRPH	Total Recoverable Petroleum Hydrocarbons
TSS	Total Suspended Solids
TTLC	Total Threshold Limit Concentration
VOA	Volatile Organic Analyte(s)

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	ARCO Products Company	**Service Request:**	S9802730
Project:	20805-121.005/TO#22312.00/RAT8/601 SAN LEANDRO	**Date Collected:**	10/14/98
Sample Matrix:	Water	**Date Received:**	10/14/98

BTEX, MTBE and TPH as Gasoline

Sample Name:	MW-13(12)	Units:	ug/L (ppb)
Lab Code:	S9802730-003	Basis:	NA
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
TPH as Gasoline	EPA 5030	CA/LUFT	50	1	NA	10/22/98	ND	
Benzene	EPA 5030	8020	0.5	1	NA	10/22/98	ND	
Toluene	EPA 5030	8020	0.5	1	NA	10/22/98	ND	
Ethylbenzene	EPA 5030	8020	0.5	1	NA	10/22/98	ND	
Xylenes, Total	EPA 5030	8020	0.5	1	NA	10/22/98	ND	
Methyl *tert*-Butyl Ether	EPA 5030	8020	3	1	NA	10/22/98	ND	

1S22/020597p

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	ARCO Products Company	**Service Request:**	S9802730
Project:	20805-121.005/TO#22312.00/RAT8/601 SAN LEANDRO	**Date Collected:**	10/14/98
Sample Matrix:	Water	**Date Received:**	10/14/98

BTEX, MTBE and TPH as Gasoline

Sample Name:	MW-14(12)	Units:	ug/L (ppb)
Lab Code:	S9802730-004	Basis:	NA
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
TPH as Gasoline	EPA 5030	CA/LUFT	50	1	NA	10/22/98	ND	
Benzene	EPA 5030	8020	0.5	1	NA	10/22/98	ND	
Toluene	EPA 5030	8020	0.5	1	NA	10/22/98	ND	
Ethylbenzene	EPA 5030	8020	0.5	1	NA	10/22/98	ND	
Xylenes, Total	EPA 5030	8020	0.5	1	NA	10/22/98	ND	
Methyl *tert*-Butyl Ether	EPA 5030	8020	3	1	NA	10/22/98	ND	

1S22/020597p

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	ARCO Products Company	**Service Request:**	S9802730
Project:	20805-121.005/TO#22312.00/RAT8/601 SAN LEANDRO	**Date Collected:**	10/14/98
Sample Matrix:	Water	**Date Received:**	10/14/98

BTEX, MTBE and TPH as Gasoline

Sample Name:	MW-7(9.5)	Units:	ug/L (ppb)
Lab Code:	S9802730-005	Basis:	NA
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
TPH as Gasoline	EPA 5030	CA/LUFT	50	1	NA	10/22/98	ND	
Benzene	EPA 5030	8020	0.5	1	NA	10/22/98	ND	
Toluene	EPA 5030	8020	0.5	1	NA	10/22/98	ND	
Ethylbenzene	EPA 5030	8020	0.5	1	NA	10/22/98	ND	
Xylenes, Total	EPA 5030	8020	0.5	1	NA	10/22/98	ND	
Methyl *tert*-Butyl Ether	EPA 5030	8020	3	1	NA	10/22/98	ND	

1S22/020597p

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	ARCO Products Company	**Service Request:**	S9802730
Project:	20805-121.005/TO#22312.00/RAT8/601 SAN LEANDRO	**Date Collected:**	10/14/98
Sample Matrix:	Water	**Date Received:**	10/14/98

BTEX, MTBE and TPH as Gasoline

Sample Name:	MW-4(8.4)	Units:	ug/L (ppb)
Lab Code:	S9802730-006	Basis:	NA
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
TPH as Gasoline	EPA 5030	CA/LUFT	50	20	NA	10/24/98	6500	
Benzene	EPA 5030	8020	0.5	20	NA	10/24/98	900	
Toluene	EPA 5030	8020	0.5	20	NA	10/24/98	63	
Ethylbenzene	EPA 5030	8020	0.5	20	NA	10/24/98	200	
Xylenes, Total	EPA 5030	8020	0.5	20	NA	10/24/98	1200	
Methyl *tert*-Butyl Ether	EPA 5030	8020	3	20	NA	10/24/98	63	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	ARCO Products Company	**Service Request:**	S9802730
Project:	20805-121.005/TO#22312.00/RAT8/601 SAN LEANDRO	**Date Collected:**	10/14/98
Sample Matrix:	Water	**Date Received:**	10/14/98

BTEX, MTBE and TPH as Gasoline

Sample Name:	MW-5(10)	Units:	ug/L (ppb)
Lab Code:	S9802730-007	Basis:	NA
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
TPH as Gasoline	EPA 5030	CA/LUFT	50	100	NA	10/23/98	33000	
Benzene	EPA 5030	8020	0.5	100	NA	10/23/98	7400	
Toluene	EPA 5030	8020	0.5	100	NA	10/23/98	1900	
Ethylbenzene	EPA 5030	8020	0.5	100	NA	10/23/98	550	
Xylenes, Total	EPA 5030	8020	0.5	100	NA	10/23/98	1700	
Methyl *tert*-Butyl Ether	EPA 5030	8020	3	100	NA	10/23/98	<300	C1

C1 The MRL was elevated due to high analyte concentration requiring sample dilution.

1S22/020597p

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	ARCO Products Company	**Service Request:**	S9802730
Project:	20805-121.005/TO#22312.00/RAT8/601 SAN LEANDRO	**Date Collected:**	10/14/98
Sample Matrix:	Water	**Date Received:**	10/14/98

BTEX, MTBE and TPH as Gasoline

Sample Name:	MW-6(8.5)	Units:	ug/L (ppb)
Lab Code:	S9802730-008	Basis:	NA
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
TPH as Gasoline	EPA 5030	CA/LUFT	50	40	NA	10/24/98	8700	
Benzene	EPA 5030	8020	0.5	40	NA	10/24/98	2400	
Toluene	EPA 5030	8020	0.5	40	NA	10/24/98	<20	C1
Ethylbenzene	EPA 5030	8020	0.5	40	NA	10/24/98	220	
Xylenes, Total	EPA 5030	8020	0.5	40	NA	10/24/98	36	
Methyl *tert*-Butyl Ether	EPA 5030	8020	3	40	NA	10/24/98	<120	C1

C1 The MRL was elevated due to high analyte concentration requiring sample dilution.

1S22/020597p

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	ARCO Products Company	**Service Request:**	S9802730
Project:	20805-121.005/TO#22312.00/RAT8/601 SAN LEANDRO	**Date Collected:**	10/14/98
Sample Matrix:	Water	**Date Received:**	10/14/98

BTEX, MTBE and TPH as Gasoline

Sample Name:	MW-3(11)	Units:	ug/L (ppb)
Lab Code:	S9802730-009	Basis:	NA
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
TPH as Gasoline	EPA 5030	CA/LUFT	50	1000	NA	10/23/98	300000	
Benzene	EPA 5030	8020	0.5	200	NA	10/23/98	1200	
Toluene	EPA 5030	8020	0.5	200	NA	10/23/98	2400	
Ethylbenzene	EPA 5030	8020	0.5	200	NA	10/23/98	5700	
Xylenes, Total	EPA 5030	8020	0.5	200	NA	10/23/98	32000	
Methyl *tert*-Butyl Ether	EPA 5030	8020	3	200	NA	10/23/98	970	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	ARCO Products Company	**Service Request:**	S9802730
Project:	20805-121.005/TO#22312.00/RAT8/601 SAN LEANDRO	**Date Collected:**	10/14/98
Sample Matrix:	Water	**Date Received:**	10/14/98

BTEX, MTBE and TPH as Gasoline

Sample Name:	MW-1(11)	Units:	ug/L (ppb)
Lab Code:	S9802730-010	Basis:	NA
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
TPH as Gasoline	EPA 5030	CA/LUFT	50	100	NA	10/23/98	47000	
Benzene	EPA 5030	8020	0.5	100	NA	10/23/98	2900	
Toluene	EPA 5030	8020	0.5	100	NA	10/23/98	<50	C1
Ethylbenzene	EPA 5030	8020	0.5	100	NA	10/23/98	2300	
Xylenes, Total	EPA 5030	8020	0.5	100	NA	10/23/98	3900	
Methyl *tert*-Butyl Ether	EPA 5030	8020	3	100	NA	10/23/98	<300	C1

C1 The MRL was elevated due to high analyte concentration requiring sample dilution.

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	ARCO Products Company	**Service Request:**	S9802730
Project:	20805-121.005/TO#22312.00/RAT8/601 SAN LEANDRO	**Date Collected:**	10/14/98
Sample Matrix:	Water	**Date Received:**	10/14/98

BTEX, MTBE and TPH as Gasoline

Sample Name:	MW-15(10)	Units:	ug/L (ppb)
Lab Code:	S9802730-011	Basis:	NA
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
TPH as Gasoline	EPA 5030	CA/LUFT	50	1	NA	10/22/98	ND	
Benzene	EPA 5030	8020	0.5	1	NA	10/22/98	ND	
Toluene	EPA 5030	8020	0.5	1	NA	10/22/98	ND	
Ethylbenzene	EPA 5030	8020	0.5	1	NA	10/22/98	ND	
Xylenes, Total	EPA 5030	8020	0.5	1	NA	10/22/98	ND	
Methyl *tert*-Butyl Ether	EPA 5030	8020	3	1	NA	10/22/98	27	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	ARCO Products Company	**Service Request:**	S9802730
Project:	20805-121.005/TO#22312.00/RAT8/601 SAN LEANDRO	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA

BTEX, MTBE and TPH as Gasoline

Sample Name:	Method Blank	Units:	ug/L (ppb)
Lab Code:	S981021-WB1	Basis:	NA
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
TPH as Gasoline	EPA 5030	CA/LUFT	50	1	NA	10/21/98	ND	
Benzene	EPA 5030	8020	0.5	1	NA	10/21/98	ND	
Toluene	EPA 5030	8020	0.5	1	NA	10/21/98	ND	
Ethylbenzene	EPA 5030	8020	0.5	1	NA	10/21/98	ND	
Xylenes, Total	EPA 5030	8020	0.5	1	NA	10/21/98	ND	
Methyl *tert*-Butyl Ether	EPA 5030	8020	3	1	NA	10/21/98	ND	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	ARCO Products Company	**Service Request:**	S9802730
Project:	20805-121.005/TO#22312.00/RAT8/601 SAN LEANDRO	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA

BTEX, MTBE and TPH as Gasoline

Sample Name:	Method Blank	Units:	ug/L (ppb)
Lab Code:	S981024-WB2	Basis:	NA
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
TPH as Gasoline	EPA 5030	CA/LUFT	50	1	NA	10/24/98	ND	
Benzene	EPA 5030	8020	0.5	1	NA	10/24/98	ND	
Toluene	EPA 5030	8020	0.5	1	NA	10/24/98	ND	
Ethylbenzene	EPA 5030	8020	0.5	1	NA	10/24/98	ND	
Xylenes, Total	EPA 5030	8020	0.5	1	NA	10/24/98	ND	
Methyl *tert*-Butyl Ether	EPA 5030	8020	3	1	NA	10/24/98	ND	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	ARCO Products Company	**Service Request:**	S9802730
Project:	20805-121.005/TO#22312.00/RAT8/601 SAN LEANDRO	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA

BTEX, MTBE and TPH as Gasoline

Sample Name:	Method Blank	Units:	ug/L (ppb)
Lab Code:	S981022-WB2	Basis:	NA
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
TPH as Gasoline	EPA 5030	CA/LUFT	50	1	NA	10/22/98	ND	
Benzene	EPA 5030	8020	0.5	1	NA	10/22/98	ND	
Toluene	EPA 5030	8020	0.5	1	NA	10/22/98	ND	
Ethylbenzene	EPA 5030	8020	0.5	1	NA	10/22/98	ND	
Xylenes, Total	EPA 5030	8020	0.5	1	NA	10/22/98	ND	
Methyl *tert*-Butyl Ether	EPA 5030	8020	3	1	NA	10/22/98	ND	

1S22/020597p

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: ARCO Products Company
Project: 20805-121.005/TO#22312.00/RAT8/601 SAN LEANDRO
Sample Matrix: Water

Service Request: S9802730
Date Collected: NA
Date Received: NA
Date Extracted: NA
Date Analyzed: NA

Surrogate Recovery Summary
BTEX, MTBE and TPH as Gasoline

Prep Method: EPA 5030
Analysis Method: 8020 CA/LUFT

Units: PERCENT
Basis: NA

Sample Name	Lab Code	Test Notes	Percent Recovery	
			4-Bromofluorobenzene	a,a,a-Trifluorotoluene
MW-13(12)	S9802730-003		95	90
MW-14(12)	S9802730-004		90	90
MW-7(9.5)	S9802730-005		91	90
MW-4(8.4)	S9802730-006		100	94
MW-5(10)	S9802730-007		97	90
MW-6(8.5)	S9802730-008		97	93
MW-3(11)	S9802730-009		110	96
MW-1(11)	S9802730-010		97	87
MW-15(10)	S9802730-011		90	92
BATCH QC	S9802844-001MS		104	89
BATCH QC	S9802844-001DMS		101	94
Method Blank	S981021-WB1		100	99
Method Blank	S981022-WB2		108	92
Method Blank	S981024-WB2		100	92
CAS Acceptance Limits:			69-116	69-116

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	ARCO Products Company	**Service Request:**	S9802730
Project:	20805-121.005/TO#22312.00/RAT8/601 SAN LEANDRO	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
		Date Extracted:	NA
		Date Analyzed:	10/24/98

Matrix Spike/Duplicate Matrix Spike Summary
BTE

Sample Name:	BATCH QC	Units:	ug/L (ppb)
Lab Code:	S9802844-001MS, S9802844-001DMS	Basis:	NA
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	Spike Level MS	Spike Level DMS	Sample Result	Spike Result MS	Spike Result DMS	Percent Recovery MS	Percent Recovery DMS	CAS Acceptance Limits	Relative Percent Difference
Benzene	EPA 5030	8020	0.5	25	25	ND	27	26	108	104	75-135	4
Toluene	EPA 5030	8020	0.5	25	25	ND	27	27	108	108	73-136	<1
Ethylbenzene	EPA 5030	8020	0.5	25	25	ND	28	27	112	108	69-142	4

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: ARCO Products Company
Project: 20805-121.005/TO#22312.00/RAT8/601 SAN LEANDRO

Service Request: S9802730
Date Analyzed: 10/24/98

Initial Calibration Verification (ICV) Summary
BTEX, MTBE and TPH as Gasoline

Sample Name: ICV
Lab Code: ICV1
Test Notes:

Units: ug/L (ppb)
Basis: NA

ICV Source:

Analyte	Prep Method	Analysis Method	True Value	Result	CAS Percent Recovery Acceptance Limits	Percent Recovery	Result Notes
TPH as Gasoline	EPA 5030	CA/LUFT	250	270	90-110	108	
Benzene	EPA 5030	8020	25	27	85-115	108	
Toluene	EPA 5030	8020	25	28	85-115	112	
Ethylbenzene	EPA 5030	8020	25	28	85-115	112	
Xylenes, Total	EPA 5030	8020	75	85	85-115	113	
Methyl *tert*-Butyl Ether	EPA 5030	8020	25	27	85-115	108	

ICV/032196

ARCO Products Company
Division of Atlantic/Richfield Company S9802730 Task Order No. 22312.00

Chain of Custody

ARCO Facility no. 0601	City (Facility) San Leandro	Project manager (Consultant) Glen VanderVeen	Laboratory Name CAS
ARCO engineer Paul Supple	Telephone no. (ARCO)	Telephone no. (Consultant) (408) 453-7300	Fax no. (Consultant) (408) 437-9526
Consultant name EMCON		Address (Consultant) 144-A Mayhew Way Walnut Creek, CA 94596	Contract Number

Sample I.D.	Lab no.	Container no.	Matrix: Soil	Matrix: Water	Matrix: Other	Preservation: Ice	Preservation: Acid	Sampling date	Sampling time	BTEX 602/EPA 8020	BTEX/TPH incld. MTBE EPA M602/8020/8015	TPH Modified 8015 Gas ☐ Diesel ☐	Oil and Grease 413.1 ☐ 413.2 ☐	TPH EPA 418.1/SM 503E	EPA 601/8010	EPA 624/8240	EPA 625/8270	TCLP Semi Metals ☐ VOA ☐ VOA ☐	CAM Metals EPA 6010/7000 TTLC ☐ STLC ☐	Lead Org/DHS ☐ Lead EPA 7420/7421 ☐			
MW-13	(12) (3)	2		X		X	HCl	10/14/98	1045		X												
MW-14	(12) (4)	2		X		X	HCl		1105		X												
MW-7	(9.5) (5)	2		X		X	HCl		1120		X												
MW-4	(9.4) (6)	2		X		X	HCl		1140		X												
MW-5	(10) (7)	2		X		X	HCl		1210		X												
MW-6	(8.5) (8)	2		X		X	HCl		1230		X												
MW-3	(11) (9)	2		X		X	HCl		1305		X												
MW-1	(11) (10)	2		X		X	HCl		1320		X												
MW-15	(10) (11)	2		X		X	HCl	↓	1340		X												

Method of shipment: Sampler will deliver

Special Detection Limit/reporting: Lowest Possible

Special QA/QC: As Normal

Remarks: RAT 8
2-40ml HCl VOAs
#209805-12LCO5

Lab Number

Turnaround Time:
- Priority Rush 1 Business Day ☐
- Rush 2 Business Days ☐
- Expedited 5 Business Days ☐
- Standard 10 Business Days ☒

Condition of sample:

Temperature received: Due: 10/28/98 R11/D3

Relinquished by sampler	Date 10/14/98	Time 1500	Received by Joseph Machado CAS 10/14/98 1500
Relinquished by	Date	Time	Received by
Relinquished by	Date	Time	Received by laboratory / Date / Time

Distribution: White Copy – Laboratory: Canary Copy – ARCO Environmental Engineering: Pink Copy – Consultant

Columbia Analytical Services INC.
An Employee-Owned Company

October 27, 1998

Service Request No.: S9802771

RECEIVED
OCT 29 1998
BY: AM

Glen Vanderveen
PINNACLE
144 A Mayhew Wy.
Walnut Creek, CA 94596

RE: 20805-121.005/TO#22312.00/RAT8/601 SAN LEANDRO

Dear Mr. Vanderveen:

The following pages contain analytical results for sample(s) received by the laboratory on October 14, 1998. Results of sample analyses are followed by Appendix A which contains sample custody documentation and quality assurance deliverables requested for this project. The work requested has been assigned the Service Request No. listed above. To help expedite our service, please refer to this number when contacting the laboratory.

Analytical results were produced by procedures consistent with Columbia Analytical Services' (CAS) Quality Assurance Manual (with any deviations noted). Signature of this CAS Analytical Report below confirms that pages 2 through 10, following, have been thoroughly reviewed and approved for release in accord with CAS Standard Operating Procedure ADM-DatRev3.

Please feel welcome to contact me should you have questions or further needs.

Sincerely,

Steven L. Green
Project Chemist

Bernadette A. Cox for

Greg Anderson
Regional QA Coordinator

COLUMBIA ANALYTICAL SERVICES, Inc.
Acronyms

A2LA	American Association for Laboratory Accreditation
ASTM	American Society for Testing and Materials
BOD	Biochemical Oxygen Demand
BTEX	Benzene, Toluene, Ethylbenzene, Xylenes
CAM	California Assessment Metals
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
COD	Chemical Oxygen Demand
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DLCS	Duplicate Laboratory Control Sample
DMS	Duplicate Matrix Spike
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
IC	Ion Chromatography
ICB	Initial Calibration Blank sample
ICP	Inductively Coupled Plasma atomic emission spectrometry
ICV	Initial Calibration Verification sample
J	Estimated concentration. The value is less than the MRL, but greater than or equal to the MDL. If the value is equal to the MRL, the result is actually <MRL before rounding.
LCS	Laboratory Control Sample
LUFT	Leaking Underground Fuel Tank
M	Modified
MBAS	Methylene Blue Active Substances
MCL	Maximum Contaminant Level. The highest permissible concentration of a substance allowed in drinking water as established by the U. S. EPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
MS	Matrix Spike
MTBE	Methyl tert-Butyl Ether
NA	Not Applicable
NAN	Not Analyzed
NC	Not Calculated
NCASI	National Council of the paper industry for Air and Stream Improvement
ND	Not Detected at or above the method reporting/detection limit (MRL/MDL)
NIOSH	National Institute for Occupational Safety and Health
NTU	Nephelometric Turbidity Units
ppb	Parts Per Billion
ppm	Parts Per Million
PQL	Practical Quantitation Limit
QA/QC	Quality Assurance/Quality Control
RCRA	Resource Conservation and Recovery Act
RPD	Relative Percent Difference
SIM	Selected Ion Monitoring
SM	Standard Methods for the Examination of Water and Wastewater, 18th Ed., 1992
STLC	Solubility Threshold Limit Concentration
SW	Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, 3rd Ed., 1986 and as amended by Updates I, II, IIA, and IIB.
TCLP	Toxicity Characteristic Leaching Procedure
TDS	Total Dissolved Solids
TPH	Total Petroleum Hydrocarbons
tr	Trace level. The concentration of an analyte that is less than the PQL but greater than or equal to the MDL. If the value is equal to the PQL, the result is actually <PQL before rounding.
TRPH	Total Recoverable Petroleum Hydrocarbons
TSS	Total Suspended Solids
TTLC	Total Threshold Limit Concentration
VOA	Volatile Organic Analyte(s)

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	ARCO Products Company	**Service Request:**	S9802771
Project:	20805-121.005/TO#22312.00/RAT8/601 SAN LEANDRO	**Date Collected:**	10/14/98
Sample Matrix:	Water	**Date Received:**	10/14/98

BTEX, MTBE and TPH as Gasoline

Sample Name:	MW-9(15)	Units:	ug/L (ppb)
Lab Code:	S9802771-001	Basis:	NA
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
TPH as Gasoline	EPA 5030	CA/LUFT	50	1	NA	10/23/98	ND	
Benzene	EPA 5030	8020	0.5	1	NA	10/23/98	ND	
Toluene	EPA 5030	8020	0.5	1	NA	10/23/98	ND	
Ethylbenzene	EPA 5030	8020	0.5	1	NA	10/23/98	ND	
Xylenes, Total	EPA 5030	8020	0.5	1	NA	10/23/98	ND	
Methyl *tert*-Butyl Ether	EPA 5030	8020	3	1	NA	10/23/98	ND	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	ARCO Products Company	**Service Request:**	S9802771
Project:	20805-121.005/TO#22312.00/RAT8/601 SAN LEANDRO	**Date Collected:**	10/14/98
Sample Matrix:	Water	**Date Received:**	10/14/98

BTEX, MTBE and TPH as Gasoline

Sample Name:	MW-10(16)	Units:	ug/L (ppb)
Lab Code:	S9802771-002	Basis:	NA
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
TPH as Gasoline	EPA 5030	CA/LUFT	50	1	NA	10/22/98	ND	
Benzene	EPA 5030	8020	0.5	1	NA	10/22/98	ND	
Toluene	EPA 5030	8020	0.5	1	NA	10/22/98	ND	
Ethylbenzene	EPA 5030	8020	0.5	1	NA	10/22/98	ND	
Xylenes, Total	EPA 5030	8020	0.5	1	NA	10/22/98	ND	
Methyl *tert*-Butyl Ether	EPA 5030	8020	3	1	NA	10/22/98	ND	

1S22/020597p

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	ARCO Products Company	**Service Request:**	S9802771
Project:	20805-121.005/TO#22312.00/RAT8/601 SAN LEANDRO	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA

BTEX, MTBE and TPH as Gasoline

Sample Name:	Method Blank	Units:	ug/L (ppb)
Lab Code:	S981021-WB1	Basis:	NA
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
TPH as Gasoline	EPA 5030	CA/LUFT	50	1	NA	10/21/98	ND	
Benzene	EPA 5030	8020	0.5	1	NA	10/21/98	ND	
Toluene	EPA 5030	8020	0.5	1	NA	10/21/98	ND	
Ethylbenzene	EPA 5030	8020	0.5	1	NA	10/21/98	ND	
Xylenes, Total	EPA 5030	8020	0.5	1	NA	10/21/98	ND	
Methyl *tert*-Butyl Ether	EPA 5030	8020	3	1	NA	10/21/98	ND	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	ARCO Products Company	**Service Request:**	S9802771
Project:	20805-121.005/TO#22312.00/RAT8/601 SAN LEANDRO	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA

BTEX, MTBE and TPH as Gasoline

Sample Name:	Method Blank	Units:	ug/L (ppb)
Lab Code:	S981022-WB2	Basis:	NA
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
TPH as Gasoline	EPA 5030	CA/LUFT	50	1	NA	10/22/98	ND	
Benzene	EPA 5030	8020	0.5	1	NA	10/22/98	ND	
Toluene	EPA 5030	8020	0.5	1	NA	10/22/98	ND	
Ethylbenzene	EPA 5030	8020	0.5	1	NA	10/22/98	ND	
Xylenes, Total	EPA 5030	8020	0.5	1	NA	10/22/98	ND	
Methyl *tert*-Butyl Ether	EPA 5030	8020	3	1	NA	10/22/98	ND	

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: ARCO Products Company
Project: 20805-121.005/TO#22312.00/RAT8/601 SAN LEANDRO
Sample Matrix: Water

Service Request: S9802771
Date Collected: NA
Date Received: NA
Date Extracted: NA
Date Analyzed: NA

Surrogate Recovery Summary
BTEX, MTBE and TPH as Gasoline

Prep Method: EPA 5030
Analysis Method: 8020 CA/LUFT

Units: PERCENT
Basis: NA

Sample Name	Lab Code	Test Notes	Percent Recovery	
			4-Bromofluorobenzene	a,a,a-Trifluorotoluene
MW-9(15)	S9802771-001		97	91
MW-10(16)	S9802771-002		86	90
BATCH QC	S9802704-004MS		115	86
BATCH QC	S9802704-004DMS		112	93
Method Blank	S981021-WB1		100	99
Method Blank	S981022-WB2		108	92
CAS Acceptance Limits:			69-116	69-116

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	ARCO Products Company	**Service Request:**	S9802771
Project:	20805-121.005/TO#22312.00/RAT8/601 SAN LEANDRO	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
		Date Extracted:	NA
		Date Analyzed:	10/22/98

Matrix Spike/Duplicate Matrix Spike Summary
BTE

Sample Name:	BATCH QC	Units:	ug/L (ppb)
Lab Code:	S9802704-004MS, S9802704-004DMS	Basis:	NA
Test Notes:			

				Spike Level		Sample	Spike Result		Percent Recovery		CAS Acceptance	Relative Percent
Analyte	**Prep Method**	**Analysis Method**	**MRL**	MS	DMS	**Result**	MS	DMS	MS	DMS	Limits	**Difference**
Benzene	EPA 5030	8020	0.5	25	25	ND	25	26	100	104	75-135	4
Toluene	EPA 5030	8020	0.5	25	25	ND	25	26	100	104	73-136	4
Ethylbenzene	EPA 5030	8020	0.5	25	25	1.5	27	28	102	106	69-142	4

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: ARCO Products Company
Project: 20805-121.005/TO#22312.00/RAT8/601 SAN LEANDRO

Service Request: S9802771
Date Analyzed: 10/22/98

Initial Calibration Verification (ICV) Summary
BTEX, MTBE and TPH as Gasoline

Sample Name: ICV
Lab Code: ICV1
Test Notes:

Units: ug/L (ppb)
Basis: NA

ICV Source:

Analyte	Prep Method	Analysis Method	True Value	Result	CAS Percent Recovery Acceptance Limits	Percent Recovery	Result Notes
TPH as Gasoline	EPA 5030	CA/LUFT	250	260	90-110	104	
Benzene	EPA 5030	8020	25	28	85-115	112	
Toluene	EPA 5030	8020	25	28	85-115	112	
Ethylbenzene	EPA 5030	8020	25	27	85-115	108	
Xylenes, Total	EPA 5030	8020	75	84	85-115	112	
Methyl *tert*-Butyl Ether	EPA 5030	8020	25	26	85-115	104	

ICV/032196

ARCO Products Company — Chain of Custody

Division of Atlantic/Richfield Company 5980273O 10/19/98 Task Order No. 22312.00

ARCO Facility no. 0601	City (Facility) San Leandro	Project manager (Consultant) Glen VanderVeen	Laboratory Name CAS
ARCO engineer Paul Supple	Telephone no. (ARCO)	Telephone no. (Consultant) (408)453-7300	Fax no. (Consultant) (408)437-9526
Consultant name EMCON	Address (Consultant) 1144-A Mayhew Way Walnut Creek, CA 94596		Contract Number

Sample I.D.	Lab no.	Container no.	Matrix: Soil	Matrix: Water	Matrix: Other	Preservation: Ice	Preservation: Acid	Sampling date	Sampling time	BTEX 602/EPA 8020	BTEX/TPH incld. MTBE EPA M602/8020/8015	TPH Modified 8015 Gas ☐ Diesel ☐	Oil and Grease 413.1 ☐ 413.2 ☐	TPH EPA 418.1/SM 503E	EPA 601/8010	EPA 624/8240	EPA 625/8270	TCLP Semi Metals ☐ VOA ☐ VOA ☐	CAM Metals EPA 6010/7000 TTLC ☐ STLC ☐	Lead Org/DHS ☐ Lead EPA 7420/7421 ☐			
MW-9(15)	1	2		X		X	HCl	10/14/98	1010		X												
MW-10(16)	2	2		X		X	HCL	✓	1030		X												

Method of shipment: Sampler will deliver

Special Detection Limit/reporting: Lowest Possible

Special QA/QC: As Normal

Remarks: RAT 8
2-40ml HCL VOAs

#70805-121.005

Lab Number: 5980277 1

Turnaround Time:

- Priority Rush 1 Business Day ☐
- Rush 2 Business Days ☐
- Expedited 5 Business Days ☐
- Standard 10 Business Days ☒

Condition of sample:

Temperature received: Due: 10/28/98 R11/D3

	Date	Time		Date	Time
Relinquished by sampler	10/14/98	1500	Received by Joseph Machado CAS	10/14/98	1500
Relinquished by	Date	Time	Received by		
Relinquished by	Date	Time	Received by laboratory	Date	Time

Distribution: White Copy – Laboratory: Canary Copy – ARCO Environmental Engineering: Pink Copy – Consultant

APPENDIX C

FIELD DATA SHEETS

FIELD REPORT
DEPTH TO WATER / FLOATING PRODUCT SURVEY

PROJECT # : **21775-208.003** STATION ADDRESS : **712 Lewelling Blvd., San Leandro** DATE : **10/14/98**

ARCO STATION # : **601** FIELD TECHNICIAN : **Mike Ross** DAY : **Wednesday**

DTW Order	WELL ID	Well Box Seal	Type Of Well Lid	Gasket Present	Lock Number	Type Of Well Cap	FIRST DEPTH TO WATER (feet)	SECOND DEPTH TO WATER (feet)	DEPTH TO FLOATING PRODUCT (feet)	FLOATING PRODUCT THICKNESS (feet)	WELL TOTAL DEPTH (feet)	COMMENTS
01	MW-9	OK	15/16"	YES	ARCO	LWC	8.29	8.29	ND	ND	16.2	
02	MW-10	OK	15/16"	YES	ARCO	LWC	8.41	8.41	ND	ND	17.6	
3	MW-12	OK	15/16"	YES	ARCO	LWC	9.06	9.06	ND	ND	11.6	
04	MW-13	OK	15/16"	YES	ARCO	LWC	8.15	8.15	ND	ND	13.0	
05	MW-14	OK	15/16"	YES	ARCO	LWC	9.73	9.73	ND	ND	13.0	
06	MW-7	OK	15/16"	YES	ARCO	LWC	9.22	9.22	ND	ND	9.6	
7	MW-11	OK	15/16"	YES	ARCO	LWC	8.58	8.58	ND	ND	11.9	
08	MW-4	OK	15/16"	YES	ARCO	LWC	7.60	7.60	ND	ND	8.5	
09	MW-5	OK	15/16"	YES	ARCO	LWC	7.19	7.19	ND	ND	10.4	ORC SOCKS IN well
10	MW-6	OK	15/16"	YES	ARCO	LWC	8.31	8.31	ND	ND	8.6	
11	MW-3	OK	HEX	YES	ARCO	LWC	7.04	7.04	ND	ND	12.0	SKIMMER IN well ORC IN SOCKS.
12	MW-1	OK	HEX	YES	ARCO	LWC	8.58	8.58	ND	ND	11.1	NO DIVERSITY SCREW IN LID
13	MW-2	OK	15/16"	YES	ARCO	LWC	7.54	7.54	ND	ND	12.4	
14	MW-15	OK	15/16"	YES	ARCO	LWC	6.26	6.26	ND	ND	10.1	
15	MW-8	OK	15/16"	YES	ARCO	LWC	7.79	7.79	ND	ND	10.2	ORC SOCK IN well

SURVEY POINTS ARE TOP OF WELL CASINGS

WATER SAMPLE FIELD DATA SHEET

Rev 1/97

OWT

PROJECT NO 21775-208.003 | SAMPLE ID MW-1(11)
PURGED BY M. Ross | CLIENT NAME ARCO 0601
SAMPLED BY M. Ross | LOCATION San Leandro, Ca

TYPE Groundwater ✓ Surface Water ____ Leachate ____ Other ____

CASING DIAMETER (inches) 2 ____ 3 ____ 4 ✓ 4.5 ____ 6 ____ Other ____

CASING ELEVATION (feet/MSL)	NR	VOLUME IN CASING (gal.)	1.69
DEPTH OF WELL (feet)	11.1	CALCULATED PURGE (gal.)	4.93
DEPTH OF WATER (feet)	8.58	ACTUAL PURGE VOL. (gal.)	5.0

DATE PURGED 10/14/98 | END PURGE 1315
DATE SAMPLED 10/14/98 | SAMPLING TIME 1320

TIME (2400 HR)	VOLUME (gal)	pH (units)	E.C. (µmhos/cm@25°c)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1310	2.0	6.68	1009	73.6	GREY	MOD
1312	3.5	6.64	1029	72.1	"	"
1315	5.0	6.66	1073	72.9	"	"

OTHER: D.O. 1.5 MG/L | ODOR: Strong | NR (COBALT 0-100) | NR (NTU 0-200)

FIELD QC SAMPLES COLLECTED AT THIS WELL (i.e. FB-1, XDUP-1) : NR

PURGING EQUIPMENT

____ 2" Bladder Pump ✓ Bailer (Teflon)
____ Centrifugal Pump ____ Bailer (PVC)
____ Submersible Pump ____ Bailer (Stainless Steel)
____ Well Wizard™ ____ Dedicated
Other: ____

SAMPLING EQUIPMENT

____ 2" Bladder Pump ✓ Bailer (Teflon)
____ Bomb Sampler ____ Bailer (Stainless Steel)
____ Dipper ____ Submersible Pump
____ Well Wizard™ ____ Dedicated
Other: DISPOSABLE

WELL INTEGRITY: OK | LOCK: ARCO

REMARKS: Heavy Sheen!

pH, E.C., Temp. Meter Calibration: Date: 10/14/98 Time: 0945 Meter Serial No.: 600832
E.C. 1000 ____ / ____ pH 7 ____ / ____ pH 10 ____ / ____ pH 4 ____ / ____
Temperature °F ____ See MW-9

SIGNATURE: Mike Ross | REVIEWED BY: ____ | PAGE 1 OF 11

WATER SAMPLE FIELD DATA SHEET

Rev. 1/97

OWT

PROJECT NO 21775-208.003 | SAMPLE ID MW-3 (11)
PURGED BY M. Ross | CLIENT NAME ARCO 0601
SAMPLED BY M. Ross | LOCATION San Lourenzo, Ca

TYPE Groundwater ✓ Surface Water ____ Leachate ____ Other ____

CASING DIAMETER (inches) 2 ____ 3 ____ 4 ✓ 4.5 ____ 6 ____ Other ____

CASING ELEVATION (feet/MSL)	NR	VOLUME IN CASING (gal.)	3.24
DEPTH OF WELL (feet)	120	CALCULATED PURGE (gal.)	9.72
DEPTH OF WATER (feet)	7.04	ACTUAL PURGE VOL. (gal.)	10.0

DATE PURGED: 10/14/98 | END PURGE: 1252
DATE SAMPLED: 10/14/98 | SAMPLING TIME: 1305

TIME (2400 HR)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm@25°c)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1244	3.5	7.64	972	70.9	GREY	MOD
1248	7.0	7.45	948	69.0	"	MOD
1252	10.0	7.37	948	69.3	"	MOD

OTHER: D.O. 1.0 mg/L ODOR: STRONG COLOR: NR (COBALT 0-100) TURBIDITY: NR (NTU 0-200)

FIELD QC SAMPLES COLLECTED AT THIS WELL (i.e. FB-1, XDUP-1): NR

PURGING EQUIPMENT

____ 2" Bladder Pump ____ Bailer (Teflon)
____ Centrifugal Pump ✓ Bailer (PVC)
____ Submersible Pump ____ Bailer (Stainless Steel)
____ Well Wizard™ ____ Dedicated
Other: ____

SAMPLING EQUIPMENT

____ 2" Bladder Pump ✓ Bailer (Teflon)
____ Bomb Sampler ____ Bailer (Stainless Steel)
____ Dipper ____ Submersible Pump
____ Well Wizard™ ____ Dedicated
Other: DISPOSABLE

WELL INTEGRITY: OK LOCK: ARCO

REMARKS:
Heavy sheen on well.

pH, E.C., Temp. Meter Calibration: Date 10/14/98 Time 0945 Meter Serial No. 600032
E.C. 1000 ____ / ____ pH 7 ____ / ____ pH 10 ____ / ____ pH 4 ____ / ____
Temperature °F See Note 9

SIGNATURE: [signature] REVIEWED BY: [signature] PAGE 2 OF 11

WATER SAMPLE FIELD DATA SHEET

Rev 1/97

OWT

PROJECT NO 2775-208.003 | SAMPLE ID MW-4 (84)
PURGED BY M. Ross | CLIENT NAME ARCO 0601
SAMPLED BY M. Ross | LOCATION San Leandro, Ca

TYPE Groundwater ✓ Surface Water ____ Leachate ____ Other ____

CASING DIAMETER (inches): 2 ____ 3 ____ 4 ✓ 4.5 ____ 6 ____ Other ____

CASING ELEVATION (feet/MSL)	NR	VOLUME IN CASING (gal.)	0.58
DEPTH OF WELL (feet)	8.5	CALCULATED PURGE (gal.)	1.76
DEPTH OF WATER (feet)	7.60	ACTUAL PURGE VOL. (gal.)	0.60

DATE PURGED: 10/14/98 | END PURGE: 1131
DATE SAMPLED: 10/14/98 | SAMPLING TIME: 1140

TIME (2400 HR)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm@25°c)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1130	0.50	7.03	1156	71.1	clr	clr
1131	DRY @ 0.60 Gallons					
1140	Recharge	6.97	1134	71.4	clr	clr

OTHER: D.O. 1.0 mg/L ODOR: None NR (COBALT 0-100) NR (NTU 0-200)

FIELD QC SAMPLES COLLECTED AT THIS WELL (i.e. FB-1, XDUP-1): NR

PURGING EQUIPMENT

____ 2" Bladder Pump ✓ Bailer (Teflon)
____ Centrifugal Pump ____ Bailer (PVC)
____ Submersible Pump ____ Bailer (Stainless Steel)
____ Well Wizard™ ____ Dedicated
Other: ____

SAMPLING EQUIPMENT

____ 2" Bladder Pump ✓ Bailer (Teflon)
____ Bomb Sampler ____ Bailer (Stainless Steel)
____ Dipper ____ Submersible Pump
____ Well Wizard™ ____ Dedicated
Other: Disposable

WELL INTEGRITY: OK LOCK: ARCO

REMARKS: ____

pH, E.C., Temp. Meter Calibration: Date: 10/14/98 Time: 0945 Meter Serial No.: 600232
E.C. 1000 ____ / ____ pH 7 ____ / ____ pH 10 ____ / ____ pH 4 ____ / ____
Temperature °F

See MW-9

SIGNATURE: [signature] REVIEWED BY: [signature] PAGE 3 OF 11

WATER SAMPLE FIELD DATA SHEET

Rev 1/97

OWT

PROJECT NO 21775-208.003 | SAMPLE ID MW-5(10)
PURGED BY M. Ross | CLIENT NAME ARCO 0601
SAMPLED BY M. Ross | LOCATION San Leandro, Ca

TYPE Groundwater ✓ Surface Water ____ Leachate ____ Other ____

CASING DIAMETER (inches): 2 ____ 3 ____ 4 ✓ 4.5 ____ 6 ____ Other ____

CASING ELEVATION (feet/MSL)	NR	VOLUME IN CASING (gal.)	2.09
DEPTH OF WELL (feet)	10.4	CALCULATED PURGE (gal.)	6.29
DEPTH OF WATER (feet)	7.19	ACTUAL PURGE VOL. (gal.)	2.5

DATE PURGED: 10/14/98 | END PURGE: 1201
DATE SAMPLED: 10/14/98 | SAMPLING TIME: 1210

TIME (2400 HR)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm@25°C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1201	2.5	7.42	1737	71.4	clr	clr
	4.5 DRY @		2.5 Gallons			
1210	Recharge	7.02	1760	72.3	clr	clr

OTHER: D.O. 1.5 mg/L ODOR: None | NR (COBALT 0-100) | NR (NTU 0-200)

FIELD QC SAMPLES COLLECTED AT THIS WELL (i.e. FB-1, XDUP-1): NR

PURGING EQUIPMENT

____ 2" Bladder Pump
____ Centrifugal Pump
____ Submersible Pump
____ Well Wizard™
____ Bailer (Teflon)
✓ Bailer (PVC)
____ Bailer (Stainless Steel)
____ Dedicated
Other: ____

SAMPLING EQUIPMENT

____ 2" Bladder Pump
____ Bomb Sampler
____ Dipper
____ Well Wizard™
✓ Bailer (Teflon)
____ Bailer (Stainless Steel)
____ Submersible Pump
____ Dedicated
Other: Disposable

WELL INTEGRITY: OK | LOCK: ARCO

REMARKS: ____

pH, E.C., Temp. Meter Calibration: Date: 10/14/98 Time: 0945 Meter Serial No: 600232
E.C. 1000 ____ / ____ pH 7 ____ / ____ pH 10 ____ / ____ pH 4 ____ / ____
Temperature °F ____

SR MW-9

SIGNATURE: ____ REVIEWED BY: ____ PAGE 4 OF 11

WATER SAMPLE FIELD DATA SHEET

Rev 1/97

OWT

PROJECT NO 21775-208.003
PURGED BY M. Ross
SAMPLED BY M. Ross

SAMPLE ID MW-6 (8.5)
CLIENT NAME ARCO 0601
LOCATION San Leandro, Ca

TYPE Groundwater ✓ Surface Water ____ Leachate ____ Other ____

CASING DIAMETER (inches) 2 ____ 3 ____ 4 ✓ 1.96 4.5 ____ 6 ____ Other ____

CASING ELEVATION (feet/MSL) NR
DEPTH OF WELL (feet) 8.6
DEPTH OF WATER (feet) 8.31

VOLUME IN CASING (gal.) 6.18
CALCULATED PURGE (gal.) 0.56
ACTUAL PURGE VOL. (gal.) 0.20

DATE PURGED 10/14/98
DATE SAMPLED 10/14/98

END PURGE 1220
SAMPLING TIME 1230

TIME (2400 HR)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm@25°c)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1220	0.20	6.97	1418	71.0	clr	clr
1220	Well	DRIED	@	0.20	Gallons	
1230	Recharge	6.94	1405	72.7	clr	clr

OTHER: D.O. 2.0 MG/L ODOR: None (COLOR: NR (COBALT 0-100)) (TURBIDITY: NR (NTU 0-200))

FIELD QC SAMPLES COLLECTED AT THIS WELL (i.e. FB-1, XDUP-1): NR

PURGING EQUIPMENT

____ 2" Bladder Pump
✓ Bailer (Teflon)
____ Centrifugal Pump
____ Bailer (PVC)
____ Submersible Pump
____ Bailer (Stainless Steel)
____ Well Wizard™
____ Dedicated
Other: ____

SAMPLING EQUIPMENT

____ 2" Bladder Pump
✓ Bailer (Teflon)
____ Bomb Sampler
____ Bailer (Stainless Steel)
____ Dipper
____ Submersible Pump
____ Well Wizard™
____ Dedicated
Other: Disposable

WELL INTEGRITY: OK
LOCK: ARCO

REMARKS:

pH, E.C., Temp. Meter Calibration: Date: 10/14/98 Time: 0945 Meter Serial No: 620232

E.C. 1000 ____ / ____ pH 7 ____ / ____ pH 10 ____ / ____ pH 4 ____ / ____

Temperature °F See MW-9

SIGNATURE: [signature] REVIEWED BY: [signature] PAGE 5 OF 11

WATER SAMPLE FIELD DATA SHEET

Rev 1/97

OWT

PROJECT NO 21775-208-003 | SAMPLE ID MW-7(9.5)
PURGED BY M. Ross | CLIENT NAME ARCO 0601
SAMPLED BY M. Ross | LOCATION San Leandro, CA

TYPE Groundwater ✓ Surface Water ____ Leachate ____ Other ____

CASING DIAMETER (inches): 2 ____ 3 ____ 4 ✓ 4.5 ____ 6 ____ Other ____
1.26

CASING ELEVATION (feet/MSL): NR
DEPTH OF WELL (feet): 9.6
DEPTH OF WATER (feet): 9.22

VOLUME IN CASING (gal.): 0.24
CALCULATED PURGE (gal.): 0.74
ACTUAL PURGE VOL (gal.): 0.25

DATE PURGED: 10/14/98 | END PURGE: 1113
DATE SAMPLED: 10/14/98 | SAMPLING TIME: 1120

TIME (2400 HR)	VOLUME (gal)	pH (units)	E.C. (µmhos/cm@25°c)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1113	0.25 well	7.10	1546	68.5 @ 0.25 Gallons	clr	clr
1120	Recharge	6.96	1542	70.7	clr	clr

OTHER: DO 1.5 mg/L ODOR: None | NR (COBALT 0-100) | NR (NTU 0-200)

FIELD QC SAMPLES COLLECTED AT THIS WELL (i.e. FB-1, XDUP-1): NR

PURGING EQUIPMENT

____ 2" Bladder Pump ✓ Bailer (Teflon)
____ Centrifugal Pump ____ Bailer (PVC)
____ Submersible Pump ____ Bailer (Stainless Steel)
____ Well Wizard™ ____ Dedicated
Other: ____

SAMPLING EQUIPMENT

____ 2" Bladder Pump ✓ Bailer (Teflon)
____ Bomb Sampler ____ Bailer (Stainless Steel)
____ Dipper ____ Submersible Pump
____ Well Wizard™ ____ Dedicated
Other: D-S/Ross-36

WELL INTEGRITY: OK | LOCK: ARCO

REMARKS: ____

pH, E.C., Temp. Meter Calibration: Date: 10/14/98 Time: 0945 Meter Serial No.: 600232
E.C. 1000 ____ / ____ pH 7 ____ / ____ pH 10 ____ / ____ pH 4 ____ / ____
Temperature °F ____

SIGNATURE: See MW-9 | REVIEWED BY: ____ PAGE 6 OF 11

WATER SAMPLE FIELD DATA SHEET

Rev 1/97

OWT

PROJECT NO 21775-208.003 | SAMPLE ID MW-9(15)
PURGED BY M. Ross | CLIENT NAME ARCO 0601
SAMPLED BY M. Ross | LOCATION San Leandro, Ca

TYPE: Groundwater ✓ Surface Water ____ Leachate ____ Other ____

CASING DIAMETER (inches): 2 ✓ 3 ____ 4 ____ 4.5 ____ 6 ____ Other ____

CASING ELEVATION (feet/MSL)	NR	VOLUME IN CASING (gal.)	1.29
DEPTH OF WELL (feet)	16.2	CALCULATED PURGE (gal.)	3.86
DEPTH OF WATER (feet)	8.29	ACTUAL PURGE VOL. (gal.)	4.0

DATE PURGED: 10/14/98 | END PURGE: 1007
DATE SAMPLED: 10/14/98 | SAMPLING TIME: 1010

TIME (2400 HR)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm@25°c)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
0956	1.5	6.94	1122	70.6	clr	clr
0958	3.0	7.01	1113	71.0	clr	clr
1001	4.0	7.08	1118	20.4	clr	clr

OTHER: D.O. 2.5 mg/L ODOR: None NR (COLOR: COBALT 0-100) NR (TURBIDITY: NTU 0-200)

FIELD QC SAMPLES COLLECTED AT THIS WELL (i.e. FB-1, XDUP-1): NR

PURGING EQUIPMENT

____ 2" Bladder Pump ✓ Bailer (Teflon)
____ Centrifugal Pump ✓ Bailer (PVC)
____ Submersible Pump ____ Bailer (Stainless Steel)
____ Well Wizard™ ____ Dedicated
Other: ____

SAMPLING EQUIPMENT

____ 2" Bladder Pump ✓ Bailer (Teflon)
____ Bomb Sampler ____ Bailer (Stainless Steel)
____ Dipper ____ Submersible Pump
____ Well Wizard™ ____ Dedicated
Other: Disposable

WELL INTEGRITY: OK | LOCK: ARCO

REMARKS: ____

pH, E.C., Temp. Meter Calibration: Date: 10/14/98 Time: 0945 Meter Serial No.: 600232
E.C. 1000 1015 1,000 pH 7 7.02 7.00 pH 10 10.04 1,000 pH 4 4.04 4.00
Temperature °F 63.5
SIGNATURE: ____ REVIEWED BY: ____ PAGE 7 OF 11

WATER SAMPLE FIELD DATA SHEET

Rev 1/97

OWT

PROJECT NO 21775-208.003 | SAMPLE ID MW-10(62)
PURGED BY M. Ross | CLIENT NAME ARCO 0601
SAMPLED BY M. Ross | LOCATION San Leandro, Ca

TYPE Groundwater ✓ Surface Water ____ Leachate ____ Other ____

CASING DIAMETER (inches) 2 ✓ 3 ____ 4 ____ 4.5 ____ 6 ____ Other ____

CASING ELEVATION (feet/MSL)	NR	VOLUME IN CASING (gal.)	1.50
DEPTH OF WELL (feet)	17.6	CALCULATED PURGE (gal.)	4.50
DEPTH OF WATER (feet)	8.41	ACTUAL PURGE VOL. (gal.)	4.5

DATE PURGED 10/14/98 | END PURGE 1019
DATE SAMPLED 10/14/98 | SAMPLING TIME 1030

TIME (2400 HR)	VOLUME (gal)	pH (units)	E.C. (µmhos/cm@25°c)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1015	1.50	7.18	1174	70.3	BRN	Heavy
1017	3.0	7.19	1172	70.5	"	"
1019	4.5	7.25	1171	70.3	"	"

OTHER: D.O. 1.0 mg/L ODOR: None NR (COBALT 0-100) NR (NTU 0-200)

FIELD QC SAMPLES COLLECTED AT THIS WELL (i.e. FB-1, XDUP-1): NR

PURGING EQUIPMENT

____ 2" Bladder Pump ✓ Bailer (Teflon)
____ Centrifugal Pump ✓ Bailer (PVC)
____ Submersible Pump ____ Bailer (Stainless Steel)
____ Well Wizard™ ____ Dedicated
Other: ____

SAMPLING EQUIPMENT

____ 2" Bladder Pump ✓ Bailer (Teflon)
____ Bomb Sampler ____ Bailer (Stainless Steel)
____ Dipper ____ Submersible Pump
____ Well Wizard™ ____ Dedicated
Other: Disposable

WELL INTEGRITY: OK LOCK: ARCO

REMARKS: ____

pH, E.C., Temp. Meter Calibration Date: 10/14/98 Time: 0945 Meter Serial No. 60023

E.C. 1000 ____ / ____ pH 7 ____ / ____ pH 10 ____ / ____ pH 4 ____ / ____

Temperature °F See MW-9

SIGNATURE: Mike R REVIEWED BY: ____ PAGE 8 OF 11

WATER SAMPLE FIELD DATA SHEET

Rev 1/97

OWT

PROJECT NO 2175-208.003 | SAMPLE ID MW-13(12)
PURGED BY M. Ross | CLIENT NAME ARCO 0601
SAMPLED BY M. Ross | LOCATION San Leandro, Ca

TYPE Groundwater ✓ Surface Water ____ Leachate ____ Other ____

CASING DIAMETER (inches) 2 ✓ 3 ____ 4 ____ 4.5 ____ 6 ____ Other ____

CASING ELEVATION (feet/MSL)	NR	VOLUME IN CASING (gal.)	0.79
DEPTH OF WELL (feet)	13.0	CALCULATED PURGE (gal.)	2.37
DEPTH OF WATER (feet)	8.15	ACTUAL PURGE VOL. (gal.)	2.5

DATE PURGED 10/14/98 | END PURGE 1037
DATE SAMPLED 10/14/98 | SAMPLING TIME 1045

TIME (2400 HR)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm@25°c)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1033	1.0	7.09	1501	69.5	Light	Clear
1035	2.0	7.09	1501	69.6	"	"
1037	2.5	7.12	1495	69.7	"	"

OTHER: D.O. 2.0 mg/L ODOR: None

COLOR: NR (COBALT 0-100) TURBIDITY: NR (NTU 0-200)

FIELD QC SAMPLES COLLECTED AT THIS WELL (i.e. FB-1, XDUP-1) : NR

PURGING EQUIPMENT

____ 2" Bladder Pump ✓ Bailer (Teflon)
____ Centrifugal Pump ____ Bailer (PVC)
____ Submersible Pump ____ Bailer (Stainless Steel)
____ Well Wizard™ ____ Dedicated
Other: ____

SAMPLING EQUIPMENT

____ 2" Bladder Pump ✓ Bailer (Teflon)
____ Bomb Sampler ____ Bailer (Stainless Steel)
____ Dipper ____ Submersible Pump
____ Well Wizard™ ____ Dedicated
Other: Disposable

WELL INTEGRITY: OK LOCK: ARCO

REMARKS: ____

pH, E.C., Temp. Meter Calibration: Date: 10/14/98 Time: 0945 Meter Serial No.: 600232

E.C. 1000 ____ / ____ pH 7 ____ / ____ pH 10 ____ / ____ pH 4 ____ / ____

Temperature °F See MW-9

SIGNATURE: Mike Ross REVIEWED BY: MA PAGE 9 OF 11

WATER SAMPLE FIELD DATA SHEET

Rev 1/97

OWT

PROJECT NO 21775-208.003 | SAMPLE ID MW-14(12)
PURGED BY M. Ross | CLIENT NAME ARCO 0601
SAMPLED BY M. Ross | LOCATION San Leandro, Ca

TYPE Groundwater ✓ Surface Water ____ Leachate ____ Other ____
CASING DIAMETER (inches) 2 ✓ 3 ____ 4 ____ 4.5 ____ 6 ____ Other ____

CASING ELEVATION (feet/MSL)	NR	VOLUME IN CASING (gal.)	0.54
DEPTH OF WELL (feet)	13.0	CALCULATED PURGE (gal.)	1.60
DEPTH OF WATER (feet)	9.73	ACTUAL PURGE VOL. (gal.)	2.0

DATE PURGED 10/14/98 | END PURGE 1055
DATE SAMPLED 10/14/98 | SAMPLING TIME 1105

TIME (2400 HR)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm@25°C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1051	0.5	6.92	1676	71.5	Light Brn	Mod
1053	1.0	6.96	1677	72.7	"	"
1055	2.0	7.04	1676	72.6	"	"

OTHER: D.O. 1.0 mg/L ODOR: None | NR (COBALT 0-100) | NR (NTU 0-200)

FIELD QC SAMPLES COLLECTED AT THIS WELL (i.e. FB-1, XDUP-1): NR

PURGING EQUIPMENT

____ 2" Bladder Pump ✓ Bailer (Teflon)
____ Centrifugal Pump ____ Bailer (PVC)
____ Submersible Pump ____ Bailer (Stainless Steel)
____ Well Wizard™ ____ Dedicated
Other: ____

SAMPLING EQUIPMENT

____ 2" Bladder Pump ✓ Bailer (Teflon)
____ Bomb Sampler ____ Bailer (Stainless Steel)
____ Dipper ____ Submersible Pump
____ Well Wizard™ ____ Dedicated
Other: Disposable

WELL INTEGRITY: OK | LOCK: ARCO

REMARKS: ____

pH, E.C., Temp. Meter Calibration: Date 10/14/98 | Time 0945 | Meter Serial No. 600232
E.C. 1000 ____ / ____ | pH 7 ____ / ____ | pH 10 ____ / ____ | pH 4 ____ / ____
Temperature °F ____

See MW-9

SIGNATURE: [signature] | REVIEWED BY: [signature] | PAGE 10 OF 11

WATER SAMPLE FIELD DATA SHEET

Rev 1/97

OWT

PROJECT NO 2775-208.003 | SAMPLE ID MW-15 (10)
PURGED BY M. Ross | CLIENT NAME ARCO 0601
SAMPLED BY M. Ross | LOCATION San Leandro, CA

TYPE Groundwater ✓ Surface Water ____ Leachate ____ Other ____

CASING DIAMETER (inches) 2 ✓ 3 ____ 4 DUP 4.5 ____ 6 ____ Other ____

CASING ELEVATION (feet/MSL)	NR	VOLUME IN CASING (gal.)	0.62
DEPTH OF WELL (feet)	10.11	CALCULATED PURGE (gal.)	1.88
DEPTH OF WATER (feet)	6.26	ACTUAL PURGE VOL. (gal.)	20

DATE PURGED: 10/14/98 | END PURGE: 1334
DATE SAMPLED: 10/14/98 | SAMPLING TIME: 1340

TIME (2400 HR)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm@25°c)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1331	1.0	7.55	1061	70.0	clr/cldy	clr
1332	1.5	7.31	1089	70.2	clr/cldy	clr
1334	2.0	7.36	1141	69.9	clr/cldy	clr

OTHER: D.O. 1.5 mg/L ODOR: None NR (COBALT 0-100) NR (NTU 0-200)

FIELD QC SAMPLES COLLECTED AT THIS WELL (i.e. FB-1, XDUP-1): NR

PURGING EQUIPMENT

____ 2" Bladder Pump ✓ Bailer (Teflon)
____ Centrifugal Pump ____ Bailer (PVC)
____ Submersible Pump ____ Bailer (Stainless Steel)
____ Well Wizard™ ____ Dedicated
Other: ____

SAMPLING EQUIPMENT

____ 2" Bladder Pump ✓ Bailer (Teflon)
____ Bomb Sampler ____ Bailer (Stainless Steel)
____ Dipper ____ Submersible Pump
____ Well Wizard™ ____ Dedicated
Other: Disposable

WELL INTEGRITY: OK LOCK: ARCO

REMARKS:

pH, E.C., Temp. Meter Calibration Date: 10/14/98 Time: 0945 Meter Serial No.: 600232
E.C. 1000 ____ / ____ pH 7 ____ / ____ pH 10 ____ / ____ pH 4 ____ / ____
Temperature °F

SIGNATURE: [signature] Sa MW-9 REVIEWED BY: NA PAGE 11 OF 11

EMCON Associates - Field Services

1921 Ringwood Avenue

San Jose, California

1998

Historical Monitoring Well Data

ARCO 601

21775-208.003

Well ID	Quarter	Date	Purge Volume (gallons)	Did well dry	Well Contained Product	Gallons
						First 96.50
						Second 47.00
						Third 37.00
						Fourth 34.00
MW-1	First	02/19/98	11.50	NO	NO	
	Second	04/23/98	9.00	YES	NO	
	Third	07/27/98	6.00	YES	NO	
	Fourth	10/14/98	5.00	YES	NO	
MW-2	First	02/19/98	5.00	YES	NO	
	Second	04/23/98	0.00	NA	NO	
	Third	07/27/98	0.00	NA	NO	
	Fourth	10/14/98	0.00	NA	NO	
MW-3	First	02/19/98	14.00	NO	NO	
	Second	04/23/98	11.00	NO	NO	
	Third	07/27/98	10.00	NO	NO	
	Fourth	10/14/98	10.00	NO	NO	
MW-4	First	02/19/98	1.50	YES	NO	
	Second	04/23/98	1.50	YES	NO	
	Third	07/27/98	1.00	YES	NO	
	Fourth	10/14/98	0.50	YES	NO	
MW-5	First	02/19/98	4.50	YES	NO	
	Second	04/23/98	4.50	YES	NO	
	Third	07/27/98	3.00	YES	NO	
	Fourth	10/14/98	2.50	YES	NO	
MW-6	First	02/19/98	2.00	YES	NO	
	Second	04/23/98	2.00	YES	NO	
	Third	07/27/98	1.00	YES	NO	
	Fourth	10/14/98	0.50	YES	NO	
MW-7	First	02/19/98	3.00	YES	NO	
	Second	04/23/98	2.00	YES	NO	
	Third	07/27/98	1.00	YES	NO	
	Fourth	10/14/98	0.50	YES	NO	
MW-8	First	02/19/98	12.00	NO	NO	
	Second	04/23/98	8.00	NO	NO	
	Third	07/27/98	0.00	NA	NO	
	Fourth	10/14/98	0.00	NA	NO	
MW-9	First	02/19/98	4.50	NO	NO	
	Second	04/23/98	0.00	NA	NO	
	Third	07/27/98	4.00	NO	NO	
	Fourth	10/14/98	4.00	NO	NO	
MW-10	First	02/19/98	7.00	NO	NO	
	Second	04/23/98	6.00	NO	NO	
	Third	07/27/98	5.00	NO	NO	
	Fourth	10/14/98	4.50	NO	NO	

EMCON Associates - Field Services | Historical Monitoring Well Data

1921 Ringwood Avenue | **1998** | ARCO 601

San Jose, California | 21775-208.003

Well ID	Quarter	Date	Purge Volume (gallons)	Did well dry	Well Contained Product		
						Gallons	
						First	**96.50**
						Second	**47.00**
						Third	**37.00**
						Fourth	**34.00**
MW-11	First	02/19/98	11.00	NO	NO		
	Second	04/23/98	0.00	NA	NO		
	Third	07/27/98	0.00	NA	NO		
	Fourth	10/14/98	0.00	NA	NO		
MW-12	First	02/19/98	10.50	NO	NO		
	Second	04/23/98	0.00	NA	NO		
	Third	07/27/98	0.00	NA	NO		
	Fourth	10/14/98	0.00	NA	NO		
MW-13	First	02/19/98	3.50	NO	NO		
	Second	04/23/98	0.00	NA	NO		
	Third	07/27/98	3.00	NO	NO		
	Fourth	10/14/98	2.50	NO	NO		
MW-14	First	02/19/98	3.50	NO	NO		
	Second	04/23/98	3.00	NO	NO		
	Third	07/27/98	2.00	NO	NO		
	Fourth	10/14/98	2.00	NO	NO		
MW-15	First	02/19/98	3.00	NO	NO	Steam water (gal)	
	Second	04/23/98	0.00	NO	NO		
	Third	07/27/98	2.00	NO	NO		
	Fourth	10/14/98	2.00	NO	NO		

ARCO Products Company
Division of Atlantic/Richfield Company

Task Order No. 22312.00

Chain of Custody

ARCO Facility no. 0601	City (Facility) San Leandro	Project manager (Consultant) Glen Vanderveen	Laboratory Name CAS
ARCO engineer Paul Supple	Telephone no. (ARCO)	Telephone no. (Consultant) (408) 453-7007	Fax no. (Consultant) (408) 437-9526
Consultant name EMCON	Address (Consultant) 1921 Ringwood Ave San Jose, CA 95131		Contract Number

Sample I.D.	Lab no.	Container no.	Matrix: Soil	Matrix: Water	Matrix: Other	Preservation: Ice	Preservation: Acid	Sampling date	Sampling time	BTEX 602/EPA 8020	BTEX/TPH EPA M8020/M8015	TPH Modified 8015 Gas ☐ Diesel ☐	Oil and Grease 413.1 ☐ 413.2 ☐	TPH EPA 418.1/SM 503E	EPA 8010/8010	EPA 8240/8240	EPA 8250/8270	TCLP Semi Metals ☐ VOA ☐ VOA ☐	CAM Metals EPA 6010/7000 TTLC ☐ STLC ☐	Lead Org/DHS ☐ Lead EPA 7420/7421 ☐			
mw-13(12')		2		X		X	HCL		1325		X												
mw-7(9')		2		X		X			1350		X												
mw-14(13')		2		X		X			1340		X												
mw-5(10')		2		X		X			1418		X												
mw-4(8')		2		X		X			1405		X												
mw-6(8')		2		X		X			1430		X												
mw-15(10')		2		X		X			1525		X												
mw-3(12')		2		X		X	X		1450		X												
mw-1(11')		2		X		X	X		1510		X												

Method of shipment: Sampler will deliver

Special Detection Limit/reporting: Lowest possible

Special QA/QC: As Normal

Remarks: RAT 9
2-40ml HCL VOAs
#20805-171 CC

Lab Number

Turnaround Time:
- Priority Rush 1 Business Day ☐
- Rush 2 Business Days ☐
- Expedited 5 Business Days ☐
- Standard 10 Business Days ☒

Condition of sample:

Temperature received:

	Date	Time		Date	Time
Relinquished by sampler	7/29/98	0900	Received by		
Relinquished by			Received by		
Relinquished by			Received by laboratory		

Distribution: White Copy – Laboratory: Canary Copy – ARCO Environmental Engineering: Pink Copy – Consultant

ARCO Products Company

Division of Atlantic/Richfield Company

Task Order No. 77312.00

Chain of Custody

ARCO Facility no. 0601	City (Facility) San Leandro	Project manager (Consultant) Glen Vanderveen	Laboratory Name CAS
ARCO engineer Paul Supple	Telephone no. (ARCO)	Telephone no. (Consultant) (408) 453-7300	Fax no. (Consultant) (408) 437-9526
Consultant name EMCON	Address (Consultant) 144-A Hayhew Way Walnut Creek, CA		Contract Number

Sample I.D.	Lab no.	Container no.	Matrix: Soil	Matrix: Water	Matrix: Other	Preservation: Ice	Preservation: Acid	Sampling date	Sampling time	BTEX 602/EPA 8020	BTEX/TPH as Gas/BTEX EPA 8020/8015	TPH Modified 8015 Gas ☐ Diesel ☐	Oil and Grease 413.1 ☐ 413.2 ☐	TPH EPA 418.1/SM 503E	EPA 601/8010	EPA 624/8240	EPA 625/8270	TCLP Semi Metals ☐ VOA ☐ VOA ☐	CAM Metals EPA 6010/7000 TTLC ☐ STLC ☐	Lead Org/DHS ☐ Lead EPA 7420/7421 ☐			
MW-9(5)		2		X		X	HCl	7-28-98	1255		X												
MW-10(3)		2		X		X	HCl	7-28-98	1310		X												

Special Detection Limit/reporting: Lowest Possible

Special QA/QC: As Normal

Remarks: RAT 8 2-40ml HCl VOAs #70805-01-001

Lab Number

Turnaround Time:

- Priority Rush 1 Business Day ☐
- Rush 2 Business Days ☐
- Expedited 5 Business Days ☐
- Standard 10 Business Days ☒

Method of shipment: Sampler will deliver.

Condition of sample:

Temperature received:

	Date	Time			
Relinquished by sampler	7/28/98	0900	Received by	D. Bins	CAS 7/28/98 1045
Relinquished by			Received by		
Relinquished by			Received by laboratory	Date	Time

Distribution: White Copy – Laboratory; Canary Copy – ARCO Environmental Engineering; Pink Copy – Consultant